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THE URGENT IMPORTANCE

OF TAKING IMMEDIATE STEPS TO PROVIDE

AIRPORTS FOR SAN FRANCISCO

CHARLES HOBART BALDWIN

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S4E

Given in memory of

JOHN BEVERLY PRESTON

by Mrs. A. T. Mercier

JOHNNY PRESTON, Class of 1930, was a man in whom the spirit of competition burned deeply. As a varsity football player whose crashing end play belied his 170 pounds, he earned Coach Glenn Warner's praise as "one of the greatest ends I've ever coached."

This same venturesome spirit impelled him to turn to aviation as his life's work. Upon his graduation from Stanford, he went to Kelly Field, Texas, where he won his second lieutenant's commission in 1931. For the next five years he served as an officer in the Air Force.

In 1936, while on flying duty at Fort Lewis, Washington, he suffered a spinal injury which ultimately terminated his military career. Despite his injury, he trained Chinese cadet pilots under General Claire Chennault in 1940–41. Denied the right to fly in World War II, he served as an aircraft inspector, and later as a private flying instructor.

Paramount in his life, which ended tragically on October 11, 1949, was his devotion to three causes: his University, his country, and aviation. This, one of a collection of books established in his memory, is a tribute to that devotion.

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Charles H. Baldwin.

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THE URGENT IMPORTANCE

OF TAKING IMMEDIATE STEPS TO PROVIDE

AIRPORTS FOR SAN FRANCISCO

CHARLES HOBART BALDWIN

MEMBER NATIONAL AERONAUTIC ASSOCIATION, GOLDEN GATE CHAPTER

MEMBER AERONAUTICS COMMITTEE, SAN FRANCISCO JUNIOR CHAMBER OF COMMERCE

MEMBER GOLDEN GATE FLYING CLUB

OCTOBER 1932

SAN FRANCISCO

IF SAN FRANCISCO is to have any share in the great air commerce that is about to develop on our Coast, it must provide suitable airports. As a result of the very bad deal that San Francisco has thus far given to aviation—thanks to those who have saddled the expensive and useless Mills Field on the City—the great air business that has been developing in the Bay region, and that ought to be centered at San Francisco, has been gradually attaching itself to the Port of Oakland and to the East Bay cities,—and San Francisco's mercantile preeminence is in danger of being transferred to the rival cities across the Bay. This pamphlet urges the development at the present time of a proper airport inside of the City and County limits; the securing and preserving of the very few suitable sites that are still available and that will be needed for the future growth of air service; and the abandonment, if possible, of the City's four million dollar project at Mills Field,—which has brought no aviation business to San Francisco in the past five years and cannot be expected to bring any in the future.

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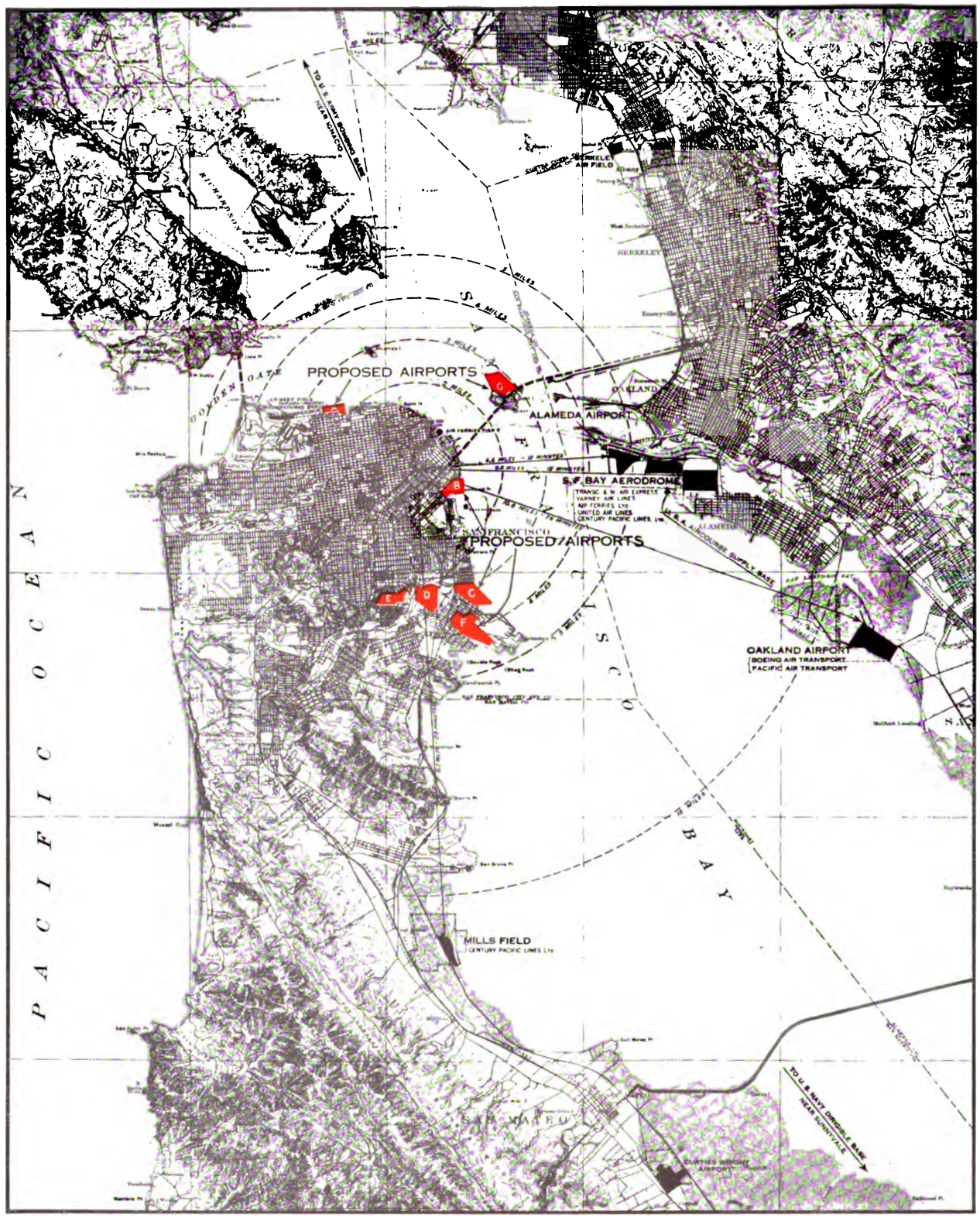


FRONTISPIECE MAP OF THE EXISTING AND PROPOSED AIRPORTS AROUND SAN FRANCISCO.

The map shows the location of the various existing and projected airports in and around the City, and the names of the air transport companies that were operating from each of the airports at the end of 1931. The Century Pacific Lines, Ltd., which in the fall of 1931 were operating from the San Francisco Bay Airdrome and from Mills Field, have since gone out of business. Mills Field is not now used by any scheduled air line. Circles with center at Third and Market Streets indicate the airline distances of the various sites from the center of San Francisco.

NOTE AS TO THE FRONTISPIECE MAP.

The black areas, shown on the Frontispiece Map opposite, represent the airports that are now developed or that are being completed around San Francisco. The red areas, lettered "A", "B", "C", etc., represent the various sites that are now available for airports within the limits of the City and County of San Francisco,—and all of these sites are described in Part II, herewith. The most available of the projected airport sites, and the only one suitable for development for a number of years, is Site "F"—Hunter's Point,—which is something over nine miles nearer by road to the center of San Francisco than Mills Field, and which can be secured and developed as a major "A 1 A" airport and seaplane base at considerably less cost than the completed Mills Field. A small but adequate airport at this site, suitable for the next few years, could be secured and developed at a cost of about a quarter of a million dollars. Two other possible sites, less suitable at present than Hunter's Point but available at a future time, are Site "A"—The Marina,—though this site would involve considerable expense in preparation and would probably be restricted to part time service on account of the prevailing fog conditions; and Site "G"—Goat Island,—which will some day become readily accessible to both San Francisco and the East Bay cities, with the completion of the great Bay Bridge,—though there is scarcely any possibility of this bridge project becoming a reality before at least five or six more years. The Hunter's Point site, on the other hand, can be developed and made available for air service at once: it is the most economic of all of the sites to develop and is, incidentally, more sheltered than the Marina and approximately one mile nearer by road to the center of San Francisco than the Goat Island site will eventually be by road and by bridge. An important feature with regard to the development of an airport at Hunter's Point is that this can be accomplished in conjunction with the reclaiming of the vast area of tidelands North and South of the Point, and with the creation of a valuable new district for the City's growing commercial and industrial needs.

The map illustrates the considerable aeronautical preparations that have been made in the East Bay district, where the air commerce of San Francisco and of the great East Bay communities has long been centered. San Francisco has as yet made no preparations for air commerce,—though the City officials invested two or three hundred thousand dollars in improving a makeshift site that was leased temporarily by the City at Mills Field, and planned—in order to save the money invested in a site which the City had made no arrangements to acquire—that we should spend another three million dollars in purchasing Mills Field and in developing this inferior site as the permanent San Francisco airport. Since Mills Field is so remote as to be useless for any purposes of practical aviation around the City,—and since it has been virtually idle and operated at enormous deficit during the whole five-year period of its existence,—it is to be hoped that enlightened public opinion will become sufficiently aroused to prevent any further wasting of the City's money on the worthless project.

PANORAMA OF THE BAY REGION LOOKING SOUTH
Showing the Existing and Proposed Airports and Bay Bridges

N. B. The airports that are now developed, or that are in process of being completed, are shown in the above picture marked with the figures 1, 2, 3, etc. The three most desirable of the projected airport sites for San Francisco are also shown in the picture and are marked with the letters "A", "F", and "G", which are the same letters used to designate these sites on the Frontispiece Map and in Part II, herewith. Far in the background from San Francisco, opposite the figure 6, may be seen the inaccessible and very costly municipal project at Mills Field, which is much too remote to be of any use for the City's aviation needs and should be abandoned. The cessation of any further wasting of the City's money upon Mills Field will enable the City to acquire and develop a proper airport within its own limits, and to share in the great air commerce that will otherwise be permanently centered on the Oakland side of the Bay.

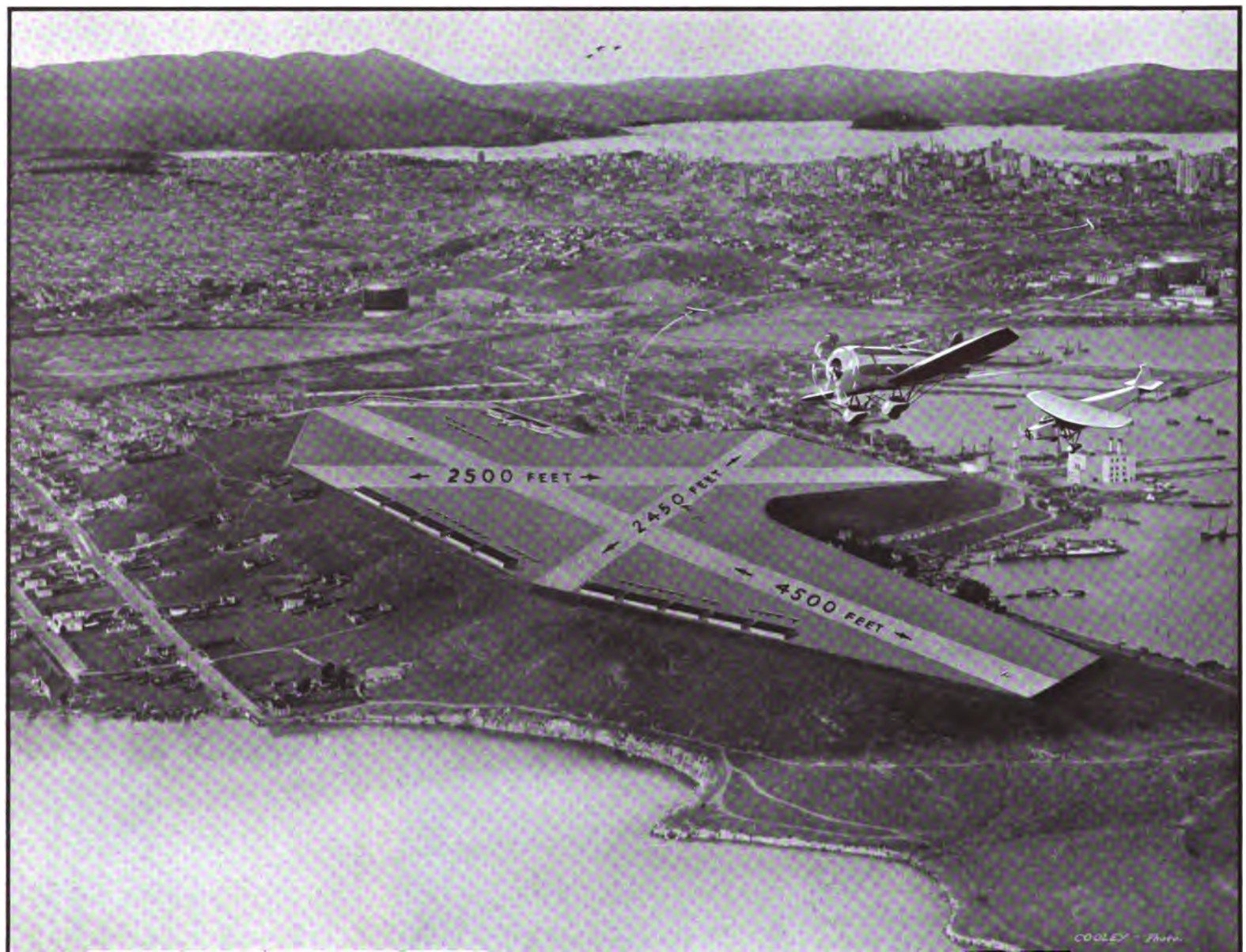
NAMES OF THE VARIOUS AIRPORTS SHOWN IN THE ABOVE PICTURE.

Projected Airports for San Francisco

A. Proposed Airport on the Marina, expanded to include the present Yacht Harbor and Crissy Field. F. Proposed Airport at Hunter's Point. G. Proposed Airport at Goat Island.

Existing Airports

1. Oakland Municipal Airport (on Bay Farm Island). 2. San Francisco Bay Airdrome (in Alameda). 3. Benton Field (U. S. Army Air Corps Supply Depot, in Alameda). 4. Curtiss Wright Airport (in Alameda). 5. Crissy Field (in the Presidio of San Francisco). 6. Mills Field (at San Bruno). 7. Curtiss Wright Airport (at San Mateo). 8. San Carlos Airport. 9. Sanders Field (in Redwood City). 10. Palo Alto Airport. 11. Naval Air Station (near Sunnyvale). 12. San Jose Airport. 13. U. S. Dept. of Commerce Intermediate Field (near Livermore).



PERSPECTIVE OF PROJECTED MAJOR AIRPORT AND SEAPLANE BASE AT HUNTER'S POINT
Proposed by Charles Hobart Baldwin.

(Eight to ten minutes distance from the center of San Francisco)

(See page 29 and pages 46 to 57)

THE IMPORTANCE OF TAKING IMMEDIATE STEPS TO PROVIDE AIRPORTS FOR SAN FRANCISCO

How important it is for San Francisco—or for any other city—to make immediate provision for adequate and accessible airports will be realized at once if we look at the recent growth of the aviation business throughout the United States. The following figures, published by the Aeronautics Branch of the Department of Commerce, show the growth of civil aviation in the United States during the past six years:—

TABLE I.

	A Number of Airports (Civil)	B Miles of Lighted Airways	C Number of Passengers Carried on Scheduled Routes	D Per Cent Increase of "C"	E Pounds of Mail, Express and Freight Carried	F Number of Civil Aircraft Active	G Number of Airplanes Manufactured (Civil and Government)
1926	92	2,041	5,782	....	814,410		1,186
1927	957	4,468	8,679	51	1,700,124	2,740	1,995
1928	1,283	6,988	49,713	472	4,279,817	5,104	4,346
1929	1,468	12,448	173,405	249	8,029,457	9,840	6193
1930	1,708	15,258	357,218*	140	8,982,246	10,830	3,437†
1931	2,013	17,512	503,375*	41	10,794,559	11,961	2,800†

N. B. The above table is limited (except for Column G) to civil aviation, and does not include Army or Navy airplanes. Nor does it include all civil aviation, being limited (in columns C, D, and E) to civil airplanes that operate on scheduled routes,—that is to say, on regular schedules between publicly designated points. Private airplanes, flying either for hire or for the convenience of the owners, and making trips that are not regularly scheduled, are not included in columns C, D, and E of the table. If these private airplanes were included, the number of passengers would have been almost five times the number shown in Column C of the above table. In 1931, for instance, while the total number of passengers carried on scheduled routes in the United States was only 503,375, the number carried on all civil airplanes (scheduled or not) was 2,389,862. Payments in 1931 for airplane carrying of the U. S. mail totaled $19,900,251.

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* These figures do not include the passengers carried across the Bay of San Francisco by the amphibian planes of the Air Ferries, Ltd., operating from the waters of the Bay near the foot of Pacific Avenue. About 60,000 of such passengers were carried in 1930, and about 19,000 in 1931.

† It will be noted that the "depression" that began in the Fall of 1929 has caused a shrinkage in airplane production in 1930 and 1931 almost as pronounced as the shrinkage in the production of automobiles, trucks, etc.

The following table shows how the present charges and scheduled time for passenger transportation by airplane from the San Francisco Bay region to other points compare with the passenger transportation by railroad to the same points:—

TABLE II.

(Figures current during the month of September, 1932, as obtained through the courtesy of the Southern Pacific Co. and of the United Air Lines.)

San Francisco Bay (Oakland) to	Rail Miles	Air Miles	Fastest Rail Time	Fastest Air Time	Railroad Fare*	Plane Fare
Fresno	206	150	5 hr. 30 m.	1 hr. 25 m.	$ 6.78	$ 8.95
Bakersfield	313	258	8 hr. 10 m.	2 hr. 30 m.	10.68	14.45
Los Angeles	471	353	12 hr. 45 m.	1 hr. 58 m.	17.04	18.95
San Diego	597	473	16 hr. 45 m.	4 hr. 20 m.	22.01	22.95
Medford, Ore.	442	343	15 hr. 30 m.	2 hr. 55 m.	19.43	20.58
Portland	771	586	21 hr.	5 hr. 15 m.	38.03	35.16
Tacoma	916	706	26 hr.	6 hr. 40 m.	44.92	42.36
Seattle	954	733	27 hr. 10 m.	7 hr. 5 m.	46.67	43.98
Sacramento	89	68	2 hr. 45 m.	22 m.	3.06	3.50
Reno	243	191	8 hr. 35 m.	2 hr.	8.59	11.46
Elko	556	460	16 hr. 53 m.	4 hr.	26.06	27.60
Salt Lake	818	692	24 hr. 20 m.	6 hr. 15 m.	28.31	41.52
Cheyenne	1266	1113	36 hr. 30 m.	10 hr. 15 m.	60.89	66.78
Omaha	1772	1597	49 hr. 55 m.	15 hr. 25 m.	83.18	95.76
Chicago	2260	2030	60 hr. 55 m.	20 hr.	103.47	115.00
New York	3243	2766	78 hr. 55 m.	27 hr.	151.53	160.00
Average of all the above trips	932.3	782.4	25 hr. 44 m.	7 hr. 20 m.	$41.92	$45.56

Average cost per mile of railroad distance.....Railroad fare 4.49 cents Plane fare 4.88 cents

In other words the airplane, at a cost of less than 10 per cent more than the fare required for the fastest train, lands you at your destination in less than one-third of the time required for the railroad trip.

* Including pullman and extra fare only when these are obligatory for fastest train service.

The foregoing tables make it clear that aviation has already become a general and useful method of transporting passengers, mail and express packages; that it is a rapidly growing part of the commercial system of our Country; and that it is likely in the near future to supplant, to a great extent, the slower methods of transportation that have heretofore prevailed. It will inevitably supplant railways, steamships and motor cars as a means of rapid transportation,—just as the railways, steamships and motor cars have supplanted the farm wagons, the canal boats and the sailing vessels that preceded them. And the business that aviation brings to a community will not mean merely the landing and departure of air passengers, mail, and express. It will include also many allied industries, which will naturally cluster around a center of airplane activity,—such as the manufacture, sale or repair of the airplanes themselves, of the engines by which they are propelled, of the special fuels needed for the engines, of the special parts and materials that are used in the making of the airplanes, and of the many instruments and devices with which they are equipped;—and it will bring into the community along with it the considerable personnel that operates in connection with these industries. It is evident, therefore, that any city that has a due regard for its future development and prosperity should take all possible measures to secure its proper share of this increasing aviation business, and should do what it can to attract this to itself before it becomes established in some other place. And the one and only thing that a city can do toward attracting to itself the air commerce of the Country is to provide within itself suitable airports at which the airplanes, that are the instruments of this rapid transportation, can safely land and take off. The great cities of our Country have developed in the past chiefly because they were the centers of important systems of railway transportation or because they had good harbors for the docking and loading of ships. And in the future development of cities through the air commerce that comes to them, no city will get any share of this commerce—or any share of the development that results from it—unless it has provided suitable airports or landing places for the airplanes. The routes of the airships through the air are free to all,—like the routes of the steamers in crossing the ocean,—and no preparation or equipment of these routes is necessary. But suitable landing places for the airships at the ends of the journeys are essential. The airports will be the clearing houses for the exchange of passengers and cargo between air, rail and ocean carriers.

The tables that I have above set forth relate mainly to scheduled transportation of passengers, mail, etc., between points at considerable distance from each other. But we must keep in mind the very much greater amount of private and non-scheduled flying that already exists, and the very rapid increase of this private and non-scheduled flying that would result if our cities were provided with suitable and accessible airports. Airplanes, as instruments for private operation,—as well as for the transportation of passengers and light cargo,—offer far greater

rapidity and directness of service than railroads or highway vehicles, and can be advantageously used as a substitute for railroad cars and automobiles in practically every form of this service except intra-urban circulation. And if our City were provided with suitable and accessible landing places for the airplanes, a huge amount of airplane traffic would soon result,—both in the form of private aviation and in the form of public lines of commuter passenger traffic,—coming to the City from a distance of one hundred miles. For an airplane of very ordinary capacity can cover one hundred miles in an hour or less; and the cost of a dependable airplane for private use is today but very little greater than the cost of a good automobile. But this development of a suburban air traffic, (whether for individual service or for commuter passengers) cannot occur until the City has established the landing places for the airplanes. And it is evident that these landing places or airports would have to be reasonably near to the heart of the City. Aviation is far from practicable when its patrons are handicapped by long and expensive "voyages" between their landing places and their destinations.

A commuter-passenger service, or a private suburban air traffic, extending to a distance of one hundred miles from San Francisco, would include Santa Cruz, Monterey, San Jose, Alameda County, Merced, Stockton, Sacramento, Vallejo, Woodland, Clear Lake, and all of Napa, Sonoma and Marin Counties. With suitable airports established in San Francisco, the City would become the focal center for all the lines of communication leading to the Bay region,—the terminal point for the air traffic of a great inland district, as well as for the great transcontinental and coastwise air lines that are now in course of development. Here is a huge new system of transportation and industry looming up in the near future; and San Francisco must prepare itself for the handling of it before it attaches itself to some other and more enterprising community.

We cannot afford to stand idle in this matter on the theory that the air commerce will come to San Francisco anyhow, without our going to the trouble of providing airports for the airplanes. We might just as well expect a large ocean commerce to develop in cities that have no harbors for the ships. The vigorous growth and prosperity of San Francisco in its early days was chiefly due to the growth of its ocean commerce; and this, in turn, was due not so much to our enterprise as to the natural monopoly that the City then enjoyed in the way of harbor and docks for ocean-going vessels. For San Francisco had at that time the only commodious harbor that then existed between British Columbia and Mexico, and the only harbor on the Pacific Coast that was connected with the Atlantic Coast by a railroad; and San Francisco was then the only place on the shores of our Bay where there was deep water for ocean-going ships immediately next to the solid land, and where piers and docks for the ships could be built at no more expense than the little communities of those early days could afford. It was chiefly because of this natural monopoly in the way of suitable harbor and

water front facilities that San Francisco became the city that it is,—growing rapidly to be the great metropolis of the Pacific Coast, while rival cities (like Portland, Los Angeles, Oakland, etc.) that lacked these harbor and waterfront facilities remained mere villages in comparison.

The natural monopoly that San Francisco possessed in its early days has now practically disappeared. Other cities on the Pacific Coast (Seattle, Portland, Los Angeles, San Diego) are now connected with the East by railroads. Los Angeles has built a harbor for itself where it had none before; and the other cities of the Pacific Coast have greatly improved the natural harbors that they had in the early days. In our own Bay, Oakland has built its solid land out as far as deep water, and has built commodious docks on its new waterfront for ocean-going ships, and similar waterfront facilities for ocean-going ships are being developed or planned at other points on the Bay. San Francisco is no longer a place to which the ocean traffic of the Pacific Ocean has got to come;—it has lost its monopoly of this traffic,—and a large part of the traffic has been secured by the enterprise of other cities, that are, in consequence forging rapidly ahead. Los Angeles, San Diego and Oakland have increased in population in the last twenty-five or thirty years three times as fast as San Francisco.

The foregoing story of the maritime commerce of our City and State shows clearly what San Francisco must do if it wishes to secure a principal share in the air commerce that is about to develop on our Coast. San Francisco has no natural monopoly in the way of fitness for air commerce,—as it once had for ocean-commerce. In fact, the steep hills that constitute a large part of the City, and the frequent fogs that prevail in its western sections make it particularly difficult for San Francisco to find suitable airports or landing places for the airplanes. But, if suitable airport sites are few in number, this means that we should be prompt to secure some of those that are now available, before their appropriation to other uses makes them no longer available for air-service. And, if the problem of securing these sites and of preparing them as airports is an expensive one, this only means that we should be prompt to secure them before they become still more expensive. We must show in this matter the same kind of energy and enterprise that Oakland and Los Angeles have shown in building the harbors and the docking sites that they originally lacked. And we must do this before the great air-commerce that is about to develop in our State has abandoned San Francisco and definitely settled elsewhere. The lines of air commerce will make their terminals only at the cities that provide suitable airports, just as the lines of ocean steamships go only to the cities that have provided suitable harbors and docks.

Assuming, then, that our City should be provided with one or more suitable airports, we come next to the question of what is a "suitable" airport. This is not a matter that is uncertain, or open to discussion, as the necessary qualities of

a suitable airport have been well established by the experience of the past few years. The two prime qualities that an airport must have are (A) safety, and (B) accessibility. Let us consider these two requirements separately.

(A) Safety,—meaning safety for the operators and passengers of the airplane and also for the inhabitants of the areas adjacent to the airport. This general requirement calls for the following precautions, viz:—

(1) As all airplanes are able to sustain themselves only while moving forward at a considerable speed, and still have this forward speed at the moment of landing, runways of sufficient length for the speed of the plane must be provided,—both for the landing and for the taking off. Small airplanes, such as the usual one or two-passenger planes, having a larger wing surface in proportion to their weight than the big planes have, can sustain themselves in the air at a lower forward speed than the big planes, and therefore do not require so long a runway in landing or taking off. Not so large an airport would, therefore, be needed for small planes as for the large planes; but if an airport is intended for use by all kinds of planes, its runways must be long enough to suffice for the largest planes that are likely to use it. For such large planes, runways of from 2500 to 3000 ft. are desirable. (See Aeronautics Bulletin No. 16,—"Airport Rating Requirements," U. S. Department of Commerce, Washington, D. C., 1929.) For small planes, runways of 2000 feet or less would usually suffice. The runways should, of course, be fairly level.

(2) As airplanes can best land or take off against the wind, the landing strips or runways should run in the direction of the various winds; and if there is some direction in which the wind of the locality particularly prevails, the principal runway of the airport should run in that direction.

(3) The main approaches to or from the airport should, of course, be free from dangerous obstacles, whether natural (such as adjacent hills) or artificial (such as high buildings, power lines, etc.).

(4) The site should be a sheltered one and as free as possible for severe winds and fog.

(5) If possible, the airport should be so located that, in taking off from it against the prevailing wind, the airplane does not have to rise over adjoining areas that are densely populated.

(B) Accessibility. An airport must, of course, be so located that it can be reached quickly and cheaply by the community that it is designed to serve. Airplanes are used chiefly for the transportation of passengers; and a large part of this passenger transportation in the future will consist of daily commuter passenger-traffic, in which the saving of time in reaching the actual destination of the passengers is essential to the usefulness of the service. The airport, in this respect, will be analogous to the passenger terminal of a great railroad system; and proximity to the center of the city is just as essential in the case of the air-

port as it is in the case of the railroad's passenger terminal. An airport that is perfectly safe, but that is difficult or expensive to reach, is of little or no value to the community which it purports to serve. It should be within five or ten minutes distance from the business center of the community; and the cost of reaching it should be not in excess of five or ten cents.

Safety and accessibility, then, are the two essential features of any airport that we must plan for our City, if we want the City to get its due share of the great aviation business that is very rapidly developing throughout the United States and the world. Nor will it suffice to arrange for only one such airport for our City. A number of them will be needed. Even small airplanes are machines of a considerable size; and all airplanes, large or small, require a considerable amount of "elbow room" for their safe operation in landing or taking off, and a considerable amount of space for their parking or storage between flights. No single airport, however commodious, will take care of the air traffic that San Francisco may reasonably expect within the next few years. A system of airports should be planned. And by specializing the functions of the different airports of the system (as, for example, limiting one airport to the use of the larger passenger-carrying planes and another to small planes,—and perhaps providing one or two airports for commuter passenger planes operating on a rapid schedule) the duties of all the airports could be so coordinated as to add greatly to the efficiency of the whole system. And such a system of airports should be planned *now*, and not at a later date,—though the actual construction of the airports of the system would naturally be done gradually, as the growth of the air traffic of the City shall require. Possible sites for suitable airports for our City are very few in number even now, and many of these will become less available from year to year, as the new building operations of our City gradually encroach upon them. We must avoid the mistakes that were made in the early days of railroad and highway development, when insufficient planning in the beginning necessitated an enormous subsequent demolition of property and an enormous additional expense. The properties that are suitable for airports for our City should be secured now, and reserved for airport purposes,—instead of postponing this until these properties have greatly increased in value and have become covered with houses and expensive buildings.

The cost of even a single, moderate-sized airport for our City will be considerable. Land that is near enough to the center of a great city to be suitable for an airport is expensive; and the conversion of a piece of land into an airport,—with the leveling of the land, and the construction of runways, hangars, offices, etc.,—involves a considerable outlay of money. A single accessible airport in our City would cost (land and all) a million or two million dollars, and a system of airports, such as I have suggested, might ultimately cost eight or ten millions. These are large figures; but they are as nothing in comparison with the sums that

Airplane photograph of the proposed Airport site on the hill at Hunter's Point,—taken in January, 1932. The vacant flat ground behind the hill (at the left hand side of the picture) is the "Army Street and Potrero Avenue" site; and the partially filled in tideland area (at the right hand side of the picture) is the "State Islais Development" at the mouth of Islais Creek.

every large city of our Country has spent on its docks and piers and highways. And, just as the docks and piers and highways have always been recognized as public necessities, essential to the growth and development of the State or City, and have been built at public expense and without reference to the direct pecuniary returns that they were likely to bring in, so the creation of a system of suitable airports for our City is now a public necessity, and is essential to the future prosperity of the City; and suitable tracts of land for such airports should be acquired and developed at public expense; and the advisability of incurring this expense should not be measured by the direct or immediate pecuniary returns that may be expected from the investment. The real returns that the City will

get on the cost of these sites will be the benefit that will come to the whole community from the fact that it will be the center of a great air traffic, and the center of a great airplane manufacturing business, and of the fifty or more allied industries whose combined activities make aviation possible.

The State Highway Commission has recently announced its programme for spending approximately $320,000,000 in the next ten years on the construction or maintenance of public highways within the State. San Francisco's contribution to this $320,000,000 of public expense (assuming that the sum is collected from the different communities of the State about in proportion to the population of the communities) will be approximately $36,000,000. Not a single dollar of direct pecuniary return is expected by San Francisco from the investment of this $36,000,000; but the investment is considered to be a wise and prudent one, because of the general benefit that will come to the City and to the State at large from an adequate system of public highways throughout the State. If San Francisco would contribute in the next ten years say $9,000,000 (which would be only a quarter of its contribution to the State Highway Fund) to the construction of a system of coordinated airports within the City, the City would find itself better equipped for aviation than any other City in the United States,—and would not only get its due share of the growing aviation business of the Country, but would be itself the aviation center of the entire Pacific Coast. Nearly every city in the United States, indeed nearly every village, has already established something that it calls an airport; but very few of these are "suitable" airports in the sense of being both safe and accessible to a large community of people; and nearly all of them are merely makeshift landing fields of little value for permanent use. No city in the United States has as yet any such system of airports as I am now suggesting,—a system that would make San Francisco one of the great air-terminals of the Country, just as our harbor made the City one of the great terminals for ocean-borne traffic.

So much for the need of a system of safe and accessible airports for our City, if we want our City to get its full share of the rapidly increasing aviation business of the Country. And now let us see what has been accomplished up to date in the way of providing airports for our City, or for that portion of the Bay region that is nearest to our City. And first let us look across the Bay, and see what has been accomplished in the vicinity of Oakland:—

On the East shore of the Bay, at various points close to Oakland and Alameda, four major airports have been planned and constructed. One of these, "Benton Field", the U. S. Army Air Corps Supply Base, being limited to use by the U. S. Army, and not available for civil aviation, need not be particularly described. The other three, namely the Oakland Municipal Airport, the San Francisco Bay Airdrome, and the Alameda Airport (which for brevity, we may designate as the three Oakland airports,—though two of them are actually in the City of Ala-

meda), together represent an investment of more than $3,000,000. All three of them have been developed and put into operation since the time when San Francisco commenced its unfortunate experiment at Mills Field,—which we will discuss presently. These Oakland airports are now not only serving the cities of Oakland and Alameda but are also handling practically all of the air traffic that is aiming at San Francisco and that should normally be handled by San Francisco. The location of these Oakland airports is shown on the map that is the frontispiece of this paper; and a glance at that map shows that the most distant of the Oakland airports is actually nearer than Mills Field to the center of San Francisco, while the other two Oakland airports are only about half as far away from San Francisco. A brief account of each of these Oakland airports is worth while:—

The Oakland Municipal Airport.

This splendidly-equipped airport, built and operated by the Port Commissioners of the City of Oakland, and located 6 miles Southeast of the center of Oakland, is the only airport on the Pacific Coast that already enjoys the Federal "A1A" rating. This airport is the scene of considerable activity and serves a great variety of useful purposes. The field is used (A) as the clearing house for the enormous air mail passing over the transcontinental and coastwise air routes of our Country, and as one of the active air passenger transport terminals; (B) as a student training base for various aviation schools, including the great Boeing School of Aeronautics, with its enrollment of students from all over the United States; (C) as a storage base for private, commercial and Government airplanes; (D) as the aviation base of one of the units of the Naval Reserve; (E) as the headquarters of the Eighth Aeronautical Inspection District, and as the center of other Federal Government services, such as the Weather Bureau and the radio, beacon and teletype communication systems; and (F) for industrial and scientific activities, including building, repairing and refitting airplanes, testing, experimental flying, etc. The airport is already a valuable asset to the port of Oakland, to which it has yielded a definite operating revenue during each of the past five years, and it will undoubtedly be an important future center of aerial industries.

The San Francisco Bay Airdrome.

This airport, built on a tract of land owned by the University of California, and operated by the San Francisco Bay Airdrome Co., is distant only five or six minutes by motor car from the business center of Oakland, and is close to the established lines of passenger communication (by rail and ferry) with San Francisco. When this airport was first started, the Oakland Municipal Airport, six miles away, was in active operation and was handling practically all of the civil air business that pertained to the Bay region. The Oakland Municipal Airport

was at that time, and it still is, a far more complete airport, and a far better equipped one, than the San Francisco Bay Airdrome; but these qualities could not avail against the much greater accessibility of the San Francisco Bay Airdrome. One by one the air passenger transport lines abandoned the better equipped Oakland Municipal Airport in favor of the more accessible Bay Airdrome,—so that, in 1931, the number of air passengers handled at the Airdrome was more than five times the number handled at the Oakland Municipal Airport. (See Appendix I for the figures.) The history of these two competitive airports furnishes us with ample proof that the close proximity of an airport to the center of the city that it is to serve is the principal factor in its success and usefulness. The San Francisco Bay Airdrome has in two years become a busy center for air traffic and a material factor in the business prosperity of the City of Oakland.

The Alameda Airport.

The Alameda Airport, owned by the City of Alameda and operated by the Curtiss-Wright Flying Service, is physically nearer to San Francisco than any other civilian airport heretofore built,—being but 4.6 miles distant "air line" from Third and Market Streets. It can be reached in 30 minutes from Third and Market Streets, at a cost of 26 cents,—the easiest and cheapest to reach (from San Francisco) of any of our local airports.* It is less convenient, however, to Oakland than the San Francisco Bay Airdrome.

These three Oakland airports are among the most outstanding airports that have been developed in the United States. They were built, and have thus far been operated, as separate enterprises, and have not as yet been coordinated into a system of airports such as I am advocating for San Francisco;—but such coordination of them could probably be arranged without great trouble, and will undoubtedly occur in the near future unless San Francisco shall have meanwhile created an adequate system of coordinated airports within its own limits. If an Oakland system of coordinated airports should come into operation while San Francisco is still without such a system, all hope of San Francisco ever having even a substantial share of the aviation business of the Country would be gone forever,—and Oakland, instead of San Francisco, would be the aviation center of the Pacific Coast.

While Oakland has been developing its airports and building up an aviation business as above described, what has San Francisco done? Let us look at our frontispiece map, on which the solid black areas show all the airports, good or bad, that have thus far been established in the Bay region. The map shows us the airports that I have described above, in or around the City of Oakland; also two

* Mills Field is now served by bus lines and can be reached from Third and Market in 35-40 minutes at a cost of 30c. Mills Field can also be reached by taxi in as little as 25 minutes, but the cost of this is from $3.50 to $5.00.

airports (the Curtiss-Wright Airport and the Mills Field) within a few miles of the town of San Mateo; but not a single airport within the City and County of San Francisco except the very limited and somewhat dangerous "Crissy Field" (in the Presidio), which is limited to U. S. Army aviation and is therefore not available for civil or commercial use. Some years ago the open strip of land on the Bay shore North of the Marina District was used for a while as a landing field for airplanes,—and should have been permanently reserved for that purpose, since it was one of the few sites, within the City and accessible to the business center of the City, that could have been developed into a useful airport at a comparatively small expense. But the use of the Marina landing field was soon given up; and for the last five years there has been no landing field or airport for civil aviation within our City and County or anywhere near it. Such aviation business as has thus far developed in the Bay region has practically developed in and around the City of Oakland. San Francisco has not now as much of the business as it had five years ago; and our City has not only not advanced in aviation in the past five years, but, because practically all the new aviation has been allowed to attach itself to the Oakland Airports, San Francisco is now in danger of becoming permanently a mere suburb of Oakland so far as aviation is concerned. There is no likelihood of our acquiring any share of the present or future aviation business of the State unless we take prompt and vigorous measures to establish safe and accessible airport facilities within the limits of the City itself, and, preferably, a system of such airport facilities. At the present moment, with no civil or commercial airport within the City or anywhere near it, we are just drifting towards commercial insignificance.

One naturally asks how San Francisco happened to get into this unfortunate situation, as regards the aviation business. And the answer to this question is simple and clear enough. The whole situation is the result of the City's unfortunate venture at Mills Field. When the use of the Marina as a landing field for airplanes was given up, some years ago, there were no airports yet in operation in Oakland, or at any point as near to our City as Oakland. Our City officials did not overlook the fact that aviation was going to be a rapidly developing business, and that it was important that San Francisco should equip itself for this new business by having an airport; but they did overlook the fact that any airport that would bring air traffic and air business to the City would have to be near the heart of the City. This was about as bad as if a Naval committee, in planning a battleship for our Country, should have overlooked the requirement that the ship should float when it was launched. So our City officials selected "Mills Field" near San Mateo as the tract that they would develop into an airport and would call the San Francisco Airport,—apparently on the theory that anything that bore the name "San Francisco" would be a real San Francisco airport, no matter where it was located. Up to the present time, our City officials have spent over $800,000

of the City's money on this field or tract near San Mateo; and their plans call for the expenditure of about $3,000,000 more, in acquiring title to the land and in developing an airport on it. As a result the City now has what it calls the "San Francisco Airport",—which has been a failure ever since it was opened to aviation approximately five years ago, is still a failure, and will continue to be a failure and of no value as an airport for San Francisco, since it is at such a distance from the heart of the City that it is and must always be practically useless for air passengers seeking rapid transportation to or from our City.

The awkwardly-placed Mills Field, located some thirteen miles distant by road from the center of the City, at a point midway between San Francisco and Redwood City, is so remote and so obviously inaccessible and useless for any of the City's aviation needs, that we might almost as well have selected a tract of land outside of the State and called it the "San Francisco Airport". The field is not only of no use as a terminal for the City's air commerce, but it is not even likely to be of any value for aerial industries, manufacturing, etc., since these industries will inevitably establish themselves as close as possible to active centers of aviation traffic. It is possible that Mills Field might in the future be of service as a training place for aviation students,—to whom the distance of the field from the City is not a matter of great importance; but as there are already plenty of other fields now available for aviation students, either across the Bay or on the Peninsula (such as the Oakland Airport and the Curtiss Wright Field near San Mateo) it is not worth while to add an additional training field for students by developing Mills Field at a cost of millions of dollars.

Perhaps no other airport project in the Country has been so generally unsatisfactory and so detrimental to the best interests of the city that has built it, as the preposterous scheme for Mills Field,—a project which cannot be supported as a plan for a real airport for our City, but rests wholly on the unwillingness of some of our officials to confess the serious blunder that they made in starting the project at all. This ill-planned scheme has already retarded the City's progress by at least five years, and has forced the City to cede its valuable terminal activities and industries to another quarter. In spite of persistent propaganda as to its merits, Mills Field is as idle today as it was five years ago; and San Francisco has practically no aviation business, because it has no accessible airport. Every air enterprise of any consequence that has ever been located at Mills Field has eventually either transferred its service to the more accessible Oakland airports or else has gone out of business. If we look at Appendix I, in which are set forth the figures of scheduled passenger air commerce at the different airports of the Bay region during the last four years, we see that Mills Field has had less than 17% of this commerce,—a trifling amount compared to the 83% enjoyed by the airports across the Bay. But more than two-thirds of this Mills Field 17% of the scheduled air passenger traffic consisted of passengers on the airships of

the Century Pacific Lines, Ltd.,—a company which was bribed into using Mills Field for a few months by the offer of the free use of the Field without any payment of the dues and charges which all air lines have to pay to airports that they make use of. If we eliminate this passenger traffic which came to Mills Field through the Century Pacific Lines, Ltd., the Mills Field percentage of the total air passenger traffic of the Bay region for the past four years was less than 6% compared to the 94% enjoyed by the East Bay airports through their own merits and on a businesslike basis. Apart from this wretched record of Mills Field in the matter of passenger traffic, it must be borne in mind that ever since 1927 absolutely all of the air mail business of the Bay region has operated through the East Bay and other outside airports, and none of it at all through Mills Field. And during the same period, practically all of the private planes connected with San Francisco or the Bay region have operated from the East Bay airports and not from Mills Field. Mills Field has provided the City with nothing except another scheme for wasting huge amounts of the taxpayer's money.

The virtual idleness of Mills Field during the last five years of its operation has naturally resulted in very slight receipts in the way of fees and charges for the use of the field, and the huge operating deficits that the City has had to meet in the Mills Field scheme must be accounted for chiefly by its unfortunate location, which has prevented the field from attracting any substantial business or traffic. The field, however, has proved itself to be a very expensive one to operate. During the five-year period ending June 30th, 1932, the cost of operating Mills Field (see Appendix V) was more than a third again as great as at the Oakland Municipal Airport, and actually came to within $7,000.00 of the total receipts at the Oakland Municipal Airport. Yet the Oakland Airport showed an operating profit for this period in excess of $75,000.00, whereas Mills Field showed a deficit of over $206,000.00. A study of the figures of Appendix V shows that Mills Field in 60 months suffered an average loss of $3,433.49 per month, while the Oakland Airport during the same period enjoyed an average profit of $1250.81 per month;—and that it cost Mills Field something like 5.7 times as much as it cost the Oakland Municipal Airport to earn each $1.00 of its gross receipts.

The story of the Mills Field scheme, from its beginning down to the present time, is one that cannot be read by any self-respecting citizen of our City without a feeling of shame; for it has been from the start a discredit to our mercantile prestige and to our civic intelligence. The remote tract on the mud flats East of San Bruno, known as Mills Field, was originally selected by the City in the early part of 1927 as a makeshift landing field to take care of the City's temporary aviation needs, pending an investigation of something more suitable in the way of a permanent site for air traffic. This particular site was chosen from a hastily collected group of suggested sites—scattered along the Peninsula and

across the Bay—for the reason that it seemed to provide the cheapest means of developing a piece of waste land, which could be leased by the City for a short term at a very nominal rental, and could then be dubbed an "airport". The new makeshift field, however, proved to be unpopular with everybody from the start: the local operators and aviation companies quickly transferred their service to the better-equipped new Oakland Municipal Airport (which was completed within a few weeks after the opening of Mills Field),—and a bond issue, submitted a year later for the improvement of Mills Field, was defeated in November, 1928. The officials, however, had commenced spending considerable sums in putting the field into shape until, by the middle of 1929, the public suddenly learned that over a quarter of a million dollars had already been spent on the field, about $217,000.00 of which (see Appendix V) had been invested in improving a tract of land which the City neither owned nor had any right to purchase,—the City's lease of which was about to expire. In order to preserve the investment of the $217,000.00,—and especially in order to cover up the disgraceful blunder of having invested the City's money in a tract which the City had made no arrangements to acquire,—the officials (or those who had charge of the matter) decided that the City must help to hide the mistakes that had been made by buying the field from the Mills Estate, at whatever price, and on whatever terms,—and regardless of the uselessness of the field as an airport site for the City. A campaign was, accordingly, started to get the scheme saddled permanently on the City,—accompanied with the usual trumped-up arguments and false propaganda. The Mills Estate, which owned the land and was in a position to make its own terms, was at first disinclined to sell,—but it later decided to enter into an agreement with the City. Since the City officials had no legal right to purchase the land without a vote of the people, and could only take an option upon it, the Mills Estate granted the option,—but not on the original tract of about 170 acres that the City had been developing and expecting to acquire as an airport. The option was given only upon the condition that the City purchase a large part of other Mills Estate holdings surrounding the airport, — making a total area of 1112 acres, consisting chiefly of sloughs and waste land,—about one-third of the 1112 acres lying under water, and more than 50% of it cut off and separated from the airport by the Bayshore Highway. This huge tract was divided into ten equal strips or parcels numbered from 1 to 10 (see the map in Appendix VI), and the City has to buy these strips in the order of their numbering, one strip per year, for 10 years, paying for each strip the sum of $105,000, and also a pro rata share of the taxes due or accruing thereon to the City of San Bruno and to the County of San Mateo. If the City fails to buy and pay for any one of the strips at the agreed time, its option to buy any of the remaining strips may be canceled by the Mills Estate. If we look at the map of the tract (Appendix VI) we see that

strip 1 lies at the North end of the tract; strip 2 is at the South end; strip 3 is again at the North end; strip 4 at the South end; and so on. The result of this arrangement is that the City is obliged to buy first the strips that are farthest away from the 170 acres of the airport itself; and that it will not acquire title to the heart of the actual airport until after it shall have bought and paid for all parts of the 1112 acres that are of no possible use for airport purposes. The arrangement was an ingenious one on the part of the Mills Estate, but a most absurd one for the City to accept. When the City officials accepted this option, they seem to have thought that the public would be more likely to support the scheme at that time rather than at a later time, when the defects of Mills Field as an airport and the absurdity of the terms of the option, should have been realized; so a second bond issue,—this time for $4,000,000,—was quickly proposed, out of which it was hoped that the necessary funds could be obtained to purchase the field from the Mills Estate and to pay for further improvements. But this second attempt to unload a bad project on the City also failed, as the voters recognized the absurdity of the whole scheme and rejected these bonds in the ensuing City Elections (November, 1930). Still, in spite of the refusal of the voters (as expressed by their rejection of bond issues on two occasions) to support the Mills Field scheme, our officials are still continuing to spend huge sums of money each year in perpetuating the original blunder,—and in so-called "economy years", too,—and out of funds that have never been authorized for this use by any vote of the people.

The third of the ten parcels that our City officials have been buying from the Mills Estate was to have been bought and paid for with the City's money in September, 1932. Shortly before this payment became due, the Golden Gate Flying Club (an organization interested in the development of aviation in and for our City) sent to the Mayor, and to some other officials of our City, a letter urging them to withhold the $105,000 that was about to be paid, and to abandon the City's option on the Mills Field tract. We quote from that letter the following paragraph as a terse summary of what the Mills Field scheme has been:—

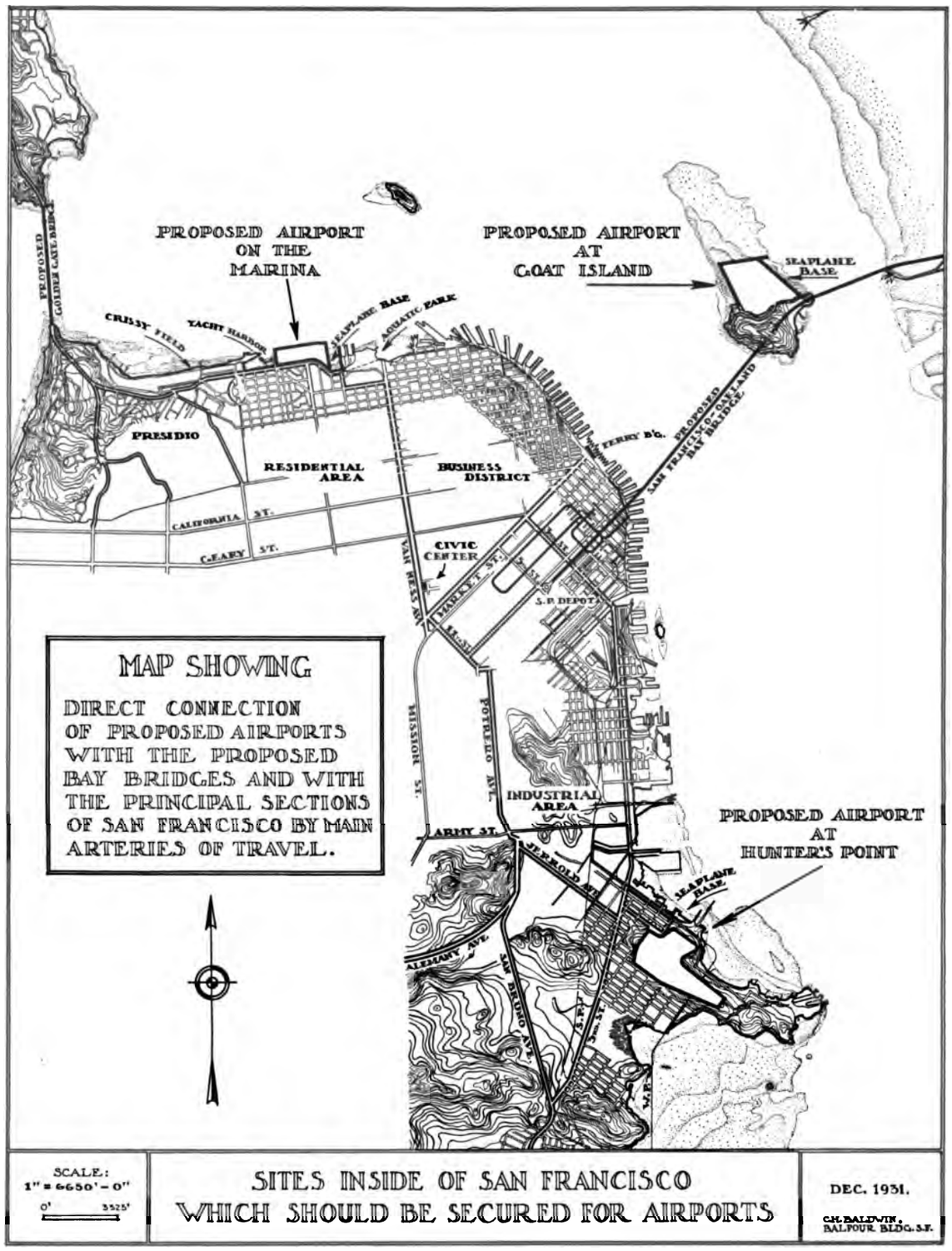
"Conceived by hysterical political parents in 1927, Mills Field is an outstandingly bad municipal project, an aeronautical joke, a civic blunder, * * * * and a monstrous City Hall extravagance,—which has cost nearly a million dollars to date, has lost over $200,000 in operations, requires the expenditure of about three millions more to complete the acquiring-and-equipping program,—and will then be exactly what it is now,—the laughing-stock of the air fraternity of the United States, and the most unemployed airport under the American flag!"

The terms of the option agreement laid down by the Mills Estate, and the City's present plan for securing and developing the miserable tract, are referred to in Mr. Adolph Uhl's interesting report, which he made in April, 1931, to the City officials who had charge of this Mills Field matter. (See Appendix VI). Fortunately the officials who have had charge of this matter had no legal authority to make any contract which would obligate the City to purchase this

Mills Field tract, or to bind the City to continue the proposed expenditure of $3,000,000 or more on the venture. So it is still possible for the City to drop the absurd scheme, to save the waste of the $3,000,000, and to apply a portion of this sum to the acquisition and construction of an airport that will be within the City and that will bring to the City its due share of the aviation business of the Country.

If we drop the Mills Field airport from further consideration, and make up our minds not to waste another dollar of the City's money on it, there is still time to make a real San Francisco airport, or a system of airports, that will bring to our City its due share of the aviation business of the Bay region. The writer has made a careful study, extending over the past two years or more, of all the sites within the City that seem to be in any way suitable for our airport needs, and in Part II of this paper has set forth a description of all of the sites that seem to be worthy of any consideration at all. There are not very many such sites; for, in spite of the large areas of land within the City limits that are still vacant and free from buildings, the sites that will be suitable for safe, efficient and accessible airports are limited, by reason of weather conditions, topography and "approaches" (that is to say, freedom from surrounding obstructions), to the areas lying along the North and East waterfronts of the City, and to the area of tidelands lying immediately North of Goat Island,—which is within the geographical limits of San Francisco. Sites that are not on the waterfront but that lie inland in the City would involve considerable danger on account of the densely populated areas that surround them; and sites on the West side of town, (such as at Sloat Boulevard and elsewhere along the Pacific shore) are subject during a large part of the year to heavy fogs that would prevent their use for purposes of aviation. So we are practically limited, in our search for airport sites, to the Bay-shore region of our City. The most desirable sites in this district have long since been secured for other purposes and are now permanently built up. The only suitable areas that have not as yet been permanently built up consist of tidelands here and there along the waterfront and of certain hills at the Southeastern end of the City that have so far escaped industrial or other development. These sites could be made available for air service by the filling in of the tidelands or by the grading down and leveling of suitable areas on the hills.

Of the possible airport sites in this sheltered district of our City, the three that are the most suitable and desirable are: (I) a portion of the land at the North end of the City, known as the Marina; (II) an area of tidelands immediately North of Goat Island; and (III) the top of the long hilly peninsula at the Southeast end of the City, East of Third Street, known as Hunter's Point. These three sites should be secured, and should be developed and put into use gradually as the City's increasing aviation business shall require. It is worthwhile to describe each


PROPOSED AIRPORT ON THE MARINA
PROPOSED AIRPORT AT GOAT ISLAND
SEAPLANE BASE
PROPOSED GOLDEN GATE BRIDGE
CRISSY FIELD
YACHT HARBOR
SEAPLANE BASE
AQUATIC PARK
PRESIDIO
RESIDENTIAL AREA
BUSINESS DISTRICT
FERRY B'G.
PROPOSED SAN FRANCISCO-OAKLAND BAY BRIDGE
CALIFORNIA ST.
GEARY ST.
CIVIC CENTER
VAN NESS AVE.
MARKET ST.
S.P. DEPOT
MISSION ST.
PORTRERO AVE.
INDUSTRIAL AREA
ARMY ST.
JERROLD AVE.
PROPOSED AIRPORT AT HUNTER'S POINT
SEAPLANE BASE
ALBANY AVE.
SAN BRUNO AVE.
MAP SHOWING
DIRECT CONNECTION OF PROPOSED AIRPORTS WITH THE PROPOSED BAY BRIDGES AND WITH THE PRINCIPAL SECTIONS OF SAN FRANCISCO BY MAIN ARTERIES OF TRAVEL.
SCALE: 1" = 6650'-0"
0' 3325'
SITES INSIDE OF SAN FRANCISCO WHICH SHOULD BE SECURED FOR AIRPORTS
DEC. 1931.
C.H. BALDWIN, BALFOUR BLDG. S.F.

of these three sites briefly, since they give better promise than any other suggested sites of furnishing our City with the kind of airports that it needs:—

I. The proposed airport on the Marina would consist of a portion of the land area North of the Marina Boulevard and of a fill extending out into the water as far as the bulkhead line. This site is very much less suitable in respect to its climatic conditions than either the Goat Island or the Hunter's Point sites, and the cost per acre of an airport at this site—$40,300—(or about 92 cents per square foot) is about 1.7 times as great as at the Goat Island site, and from 3 to 6 times as great as at the Hunter's Point site. Nevertheless, the site is very close indeed to the heart of the City and should be secured as an additional overflow base for fair weather use and for a great future traffic of privately-operated airplanes, seaplanes, autogiros, etc. The mere securing of this site for purposes of aviation would not necessarily involve any expenditure of money, since all of the required area is now property of the State and of the City. This airport might eventually be expanded in a westerly direction to include the site of the present Yacht Harbor and all of the land at Crissy Field.

II. The picturesque site at Goat Island, suggested by Major Harvey S. Burwell, A. C., would be formed by filling in the large area of tidelands North of the Island. After the completion of the great San Francisco-Oakland Bay bridge, this site will enjoy ready connection by automobile and street railway service with both San Francisco and the East Bay cities. The cost per acre of developing an airport at this site would be about $23,000, (or about 53 cents per square foot), —which is considerably less than in the case of the Marina, though it would still be from about 1.7 to almost four times as great as at Hunter's Point. This site, however, has a serious disadvantage with reference to its development at the present time, as the site will be of no practical use as an airport until after the Bay bridge is completed,—which is not likely to occur for quite a number of years.

III. The proposed airport at Hunter's Point would be formed by grading down and leveling a sufficient area on the Hunter's Point uplands, which appear to be generally sheltered and which lie within fairly close access to the center of town. This site can be developed at a reasonable cost,—its cost per acre varying between $6,150 and $13,700 (that is, between 14 and 31 cents per square foot), depending upon whether we choose to purchase, grade and equip a small airport, or a medium-sized one, or a large one. This cost per acre compares not unfavorably with the probable cost of securing and developing a worthless airport at Mills Field. If the considerable air commerce now aiming at San Francisco over the air passenger, air mail and air express lines (See Appendices I, II and III) could be concentrated in an airport at this particular site, which is the most generally convenient and economic of all our available sites,—instead of being scattered among the airports across the Bay, it is entirely possible that the revenue which could come through terminal fees and port charges would be sufficient to

make the airport at this point a self-liquidating and self-supporting commercial venture.

Of course an airport in the very center of the City would be the ideal thing for purposes of aviation alone; but such a central airport is now no longer possible for our City, or for any large city. Interesting suggestions have been made for the building of huge platforms (that would serve as airports) over some of the piers and railroad yards in the City,—for the purpose of getting airports that would be very close to the City's center; but all such schemes would be too expensive to be practicable at the present time. Some scheme of that kind may be justifiable or even necessary at some future date, when the passenger-commuter service by airplane to or from our City has developed to a point that will justify the expense of an airport on a platform.

Part II of this paper consists of individual descriptions of the various sites within the limits of our City and County that seem at all suitable for air service. Since there has been a great deal of controversy in the past regarding the question of which is the best site, the author has not limited his study to any single site or project, but has endeavored to include all that are still available,—with the purpose of comparing their relative advantages and disadvantages on the basis of facts. The descriptions that follow include seven possible airport sites, though only the three sites above described (at the Marina, at Goat Island, and at Hunter's Point) seem to be worthy of serious consideration. The descriptions include drawings showing the location, plan, dimensions, etc., of each of the sites, and are accompanied by a discussion of their various advantages, disadvantages, cost, etc. In regard to the estimated cost of the various projects, the writer has made use of figures for the cost of land that are based upon its probable purchase price during the next three or four year period, as supplied by leading real estate authorities in the City. The cost of the engineering work required at each of the sites, including grading, filling, bulkheading, etc., has been estimated by practicing civil engineers, and their figures have all been carefully reviewed and checked by Mr. Lochiel M. King, C. E., of San Francisco. To the above two items of cost (that is, the cost of purchasing land and the cost of preparing it) a further allowance has been added in each case to cover the cost of the initial equipment needed for the field, including the necessary hangars, offices, runways, system of drainage, lighting, etc.,—and the cost of this has been estimated on the basis of an arbitrarily chosen figure of $2,000 per acre on each acre of the area effective for flying purposes. To the total of all of the above items a further allowance of at least 10% extra—and in the case of Hunter's Point, 20% extra—has been added to take care of contingencies and unforeseen expenses. All areas are based upon planimeter readings by Mr. J. M. Marion, Engineering Draughtsman.

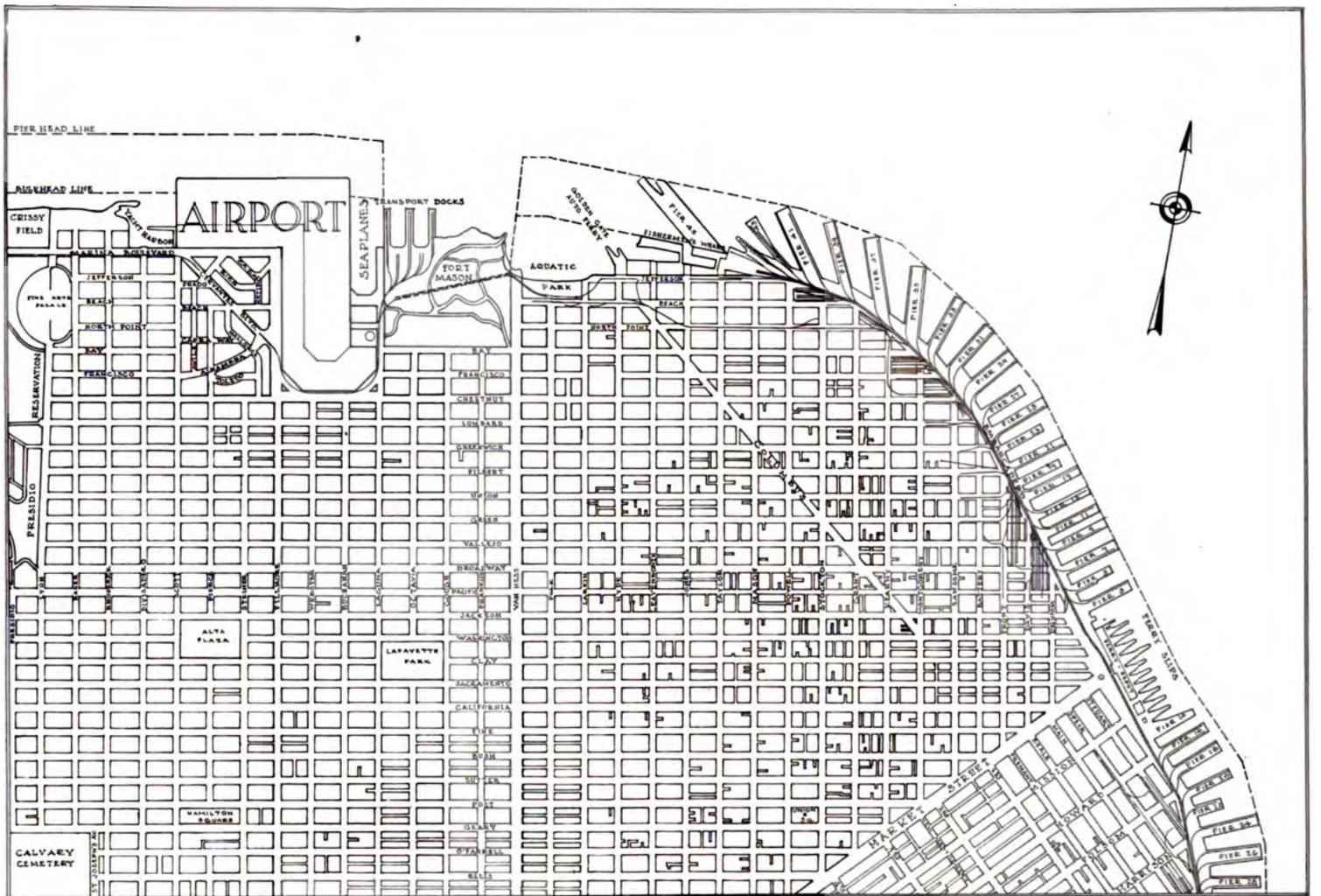
The writer acknowledges his indebtedness to the many individuals who have contributed information and valuable assistance. The writer is especially indebted

to Mr. Mario F. Corbett, Architect, of San Francisco, for assistance in the preparation of many of the maps and for many useful services in the line of his profession; and also to Mr. Lochiel M. King, C. E., for his analysis of the cost of engineering work required at each of the sites and, especially, for the excellent grading plans and designs which he prepared for the sites at Bernal Hills and at Hunter's Point, which involve cutting down and grading the hills at these two places.

The writer has endeavored to set forth accurately and truthfully such data as have been obtained, with the purpose of throwing some light upon what he conceives to be an important civic and scientific problem. During the period of two or more years in which he has been engaged in these studies his judgment has not been influenced by any thought of mercenary gain or by any motive of personal profit.

CHARLES HOBART BALDWIN.

San Francisco,
October, 1932.


PIER HEAD LINE
BULKHEAD LINE
AIRPORT
SEAPLANES
TRANSPORT DOCKS
CRISSY FIELD
YACHT HARBOR
MARINA BOULEVARD
FORT MASON
AQUATIC PARK
GOLDEN GATE AUTO FERRY
FISHERMEN'S WHARF
FINE ARTS PALACE
JEFFERSON
BEACH
NORTH POINT
BAY
FRANCISCO
RESERVATION
PRESIDIO
CHESTNUT
LOMBARD
GREENWICH
FILBERT
UNION
GREEN
VALLEJO
BROADWAY
PACIFIC
JACKSON
WASHINGTON
CLAY
SACRAMENTO
CALIFORNIA
PINE
BUSH
SUTTER
POST
GEARY
O'FARRELL
ELLIS
ALTA PLAZA
LAFAYETTE PARK
WASHINGTON SQUARE
CALVARY CEMETERY
ST. JOSEPH'S
MARKET STREET
FERRY SLIPS
PIER 1
PIER 2
PIER 3
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PIER 37
PIER 39
PIER 41
PIER

DESCRIPTIONS OF THE VARIOUS SITES THAT ARE NOW AVAILABLE FOR AIRPORTS WITHIN THE LIMITS OF THE CITY AND COUNTY OF SAN FRANCISCO

SITE A—THE MARINA.

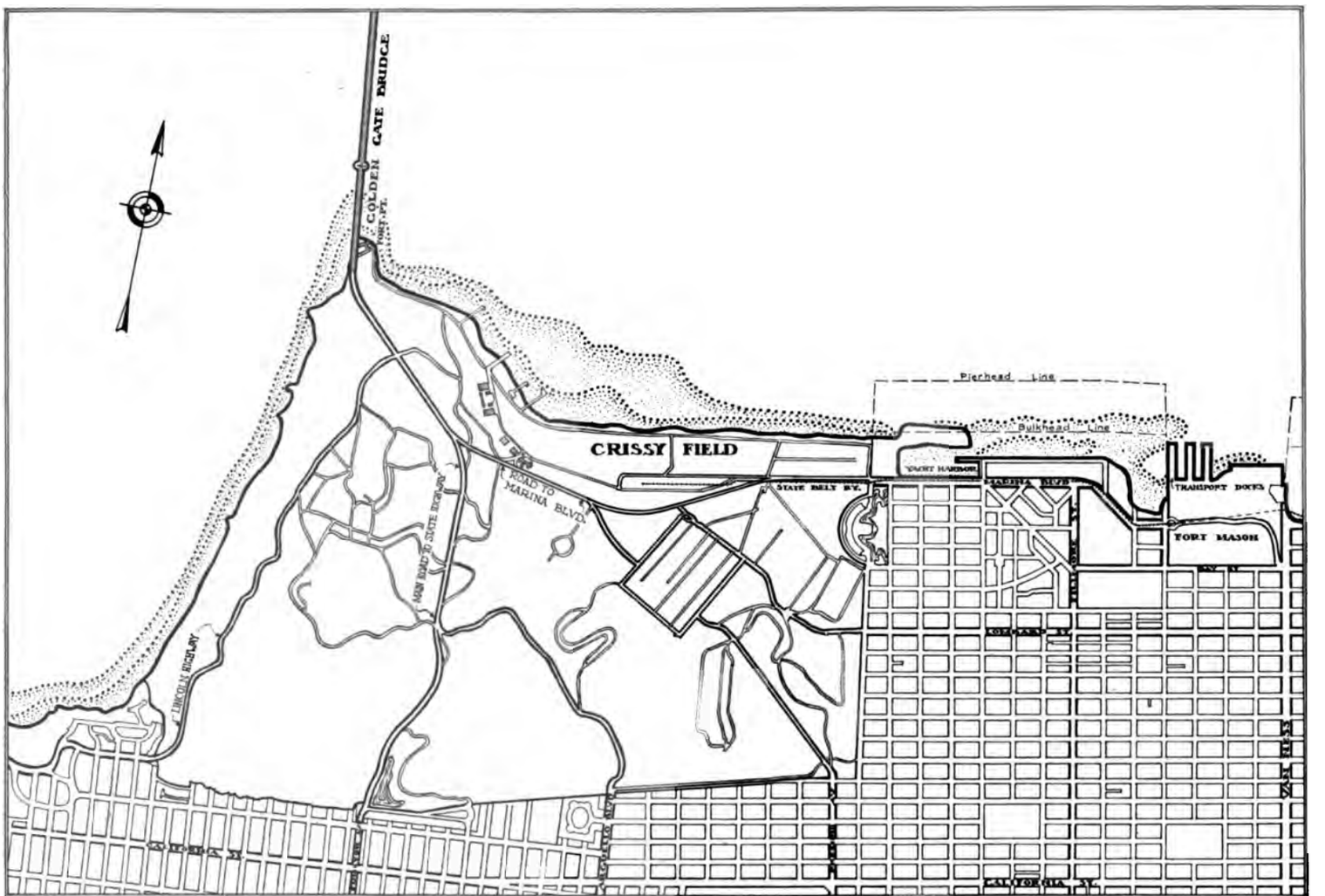
Total Area Required	45 Acres
Estimated Total Cost*	$1,817,000
Estimated Cost per Acre*	$ 40,300

N. B. The airport on the Marina would not include the area South of the Marina Boulevard, as indicated upon Map A-1, herewith. The area required for the airport would be limited to the land North of the Marina Boulevard and to a fill extending as far out as the "bulkhead line". The field would have the form of a single landing strip, as indicated on the Frontispiece Map and on the map on page 28. Since the recent rezoning of the area South of the Boulevard for residential purposes, this area has become built up and is now no longer available for air service. The entire area North of the Boulevard, however, is now property owned either by the State or by the City, and no private property would have to be purchased for the scheme.

The Marina has the very serious disadvantage of being exposed to frequent fog coming in through the Golden Gate, and it would, moreover, be very expensive to develop. This site, however, is one of the very few convenient places in the City which could be used as an auxiliary base during fair weather to accommodate an increased future traffic of airplanes, seaplanes and autogiros. The site is readily accessible to the business and residential districts, and it could be expanded at a future time—should there be need—into a very considerable area. Except for its defects due to the fog, the Marina has an advantage over most of the other sites in regard to safety. Located at the North end of the City, an airport on the Marina would enable airplane operators to profit by the prevailing West and North winds without ever being obliged to "take off" over the City;—an important feature, since it eliminates the chance of injuring people on the streets.

The site is sufficiently large to provide a runway 2400 feet long East and West, and room for a considerable amount of parking and storage. The field in its initial development would not encroach upon the St. Francis Yacht Club harbor, though it would necessitate the expansion of this harbor elsewhere than where it is at

* Developed and equipped as an airport.



SCALE:
1" = 2500'
0' 2500'

MAP A-4
SHOWING LOCATION OF CRISSY FIELD
IN THE PRESIDIO, SAN FRANCISCO

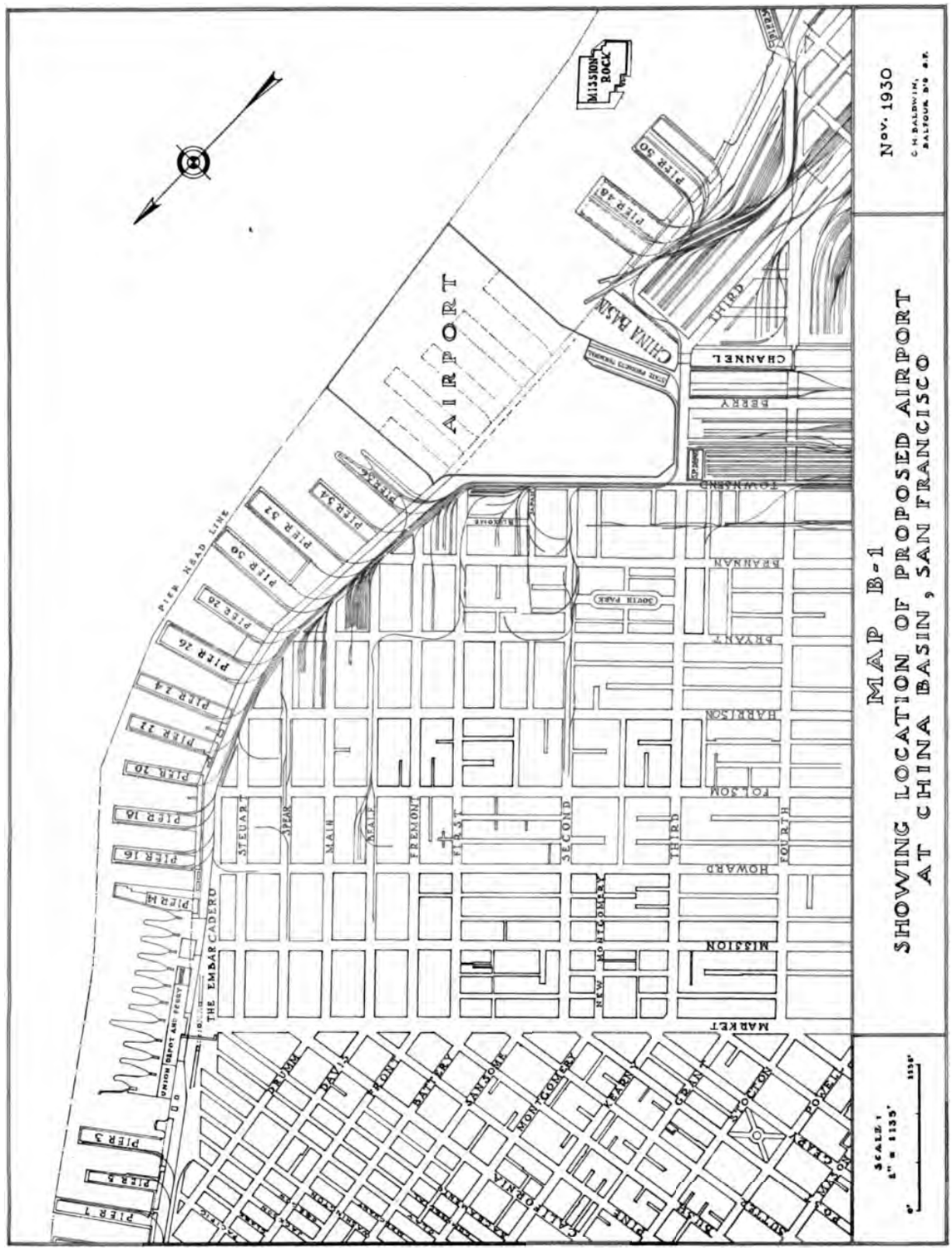
JULY 1931

C.H.BALDWIN
BALFOUR B'G. S.F.

present being carried out. An airport on the Marina could be expanded at a future time to include all of the area between Fort Mason and Crissy Field; and, with the need for still further enlargement, it is possible that future arrangements could be made for its inclusion of Crissy Field in an expanded right of way for civil aviation.

The airport on the Marina as now mapped would cover a total area of approximately 45 acres, which is more than one half again the area at present effective for flying purposes at Crissy Field. The site is composed of approximately 18 acres of solid land and of about 27 acres of submerged land, which would have to be filled in,—the entire area being public property. The cost of developing the airport has been estimated upon an assumption that the State and City authorities would set aside without cost the lands and waters required for this scheme lying within their jurisdiction. If this were done, the cost of the airport would be limited to (A) the cost of making a fill from the present waterfront line out as far as the bulkhead line*; and, (B) the cost of preparing and equipping the total area of 45 acres for airport purposes. The total cost of the airport, including an allowance of 10 per cent extra to take care of unforeseen expenses, is estimated to be $1,817,000.

* Area of fill: 1,176,000 square feet. This would require a seawall 4350 feet in length to retain the fill. Because of the depth of water (approximately 35 feet below low water) and the heavy ground swell from the ocean, it would require a heavy rock seawall. Sand for the fill could be pumped in from the Bay. Engineer's estimate of the cost of seawalls, fill and rock top dressing: $1,562,000.


MAP B-1
SHOWING LOCATION OF PROPOSED AIRPORT
AT CHINA BASIN, SAN FRANCISCO
NOV. 1930
C. H. BALDWIN,
BALFOUR B'D A.R.
SCALE:
1" = 1135'
0'
1135'
AIRPORT
CHINA BASIN
CHANNEL
MISSION ROCK
PIER HEAD LINE
THE EMBARCADERO
UNION DEPOT AND FERRY
STEUART
SPEAR
MAIN
SEAL
FREMONT
FIRST
SECOND
THIRD
FOURTH
HOWARD
FOLSOM
HARRISON
BRYANT
BRANNAN
TOWNSEND
BERRY
MISSION
MARKET
NEW MONTGOMERY
SOUTH PARK
PIER 1
PIER 3
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PIER 35
PIER 37
PIER 39
PIER 41
PIER 43
PIER 45
PIER 47
PIER 49
PIER 51

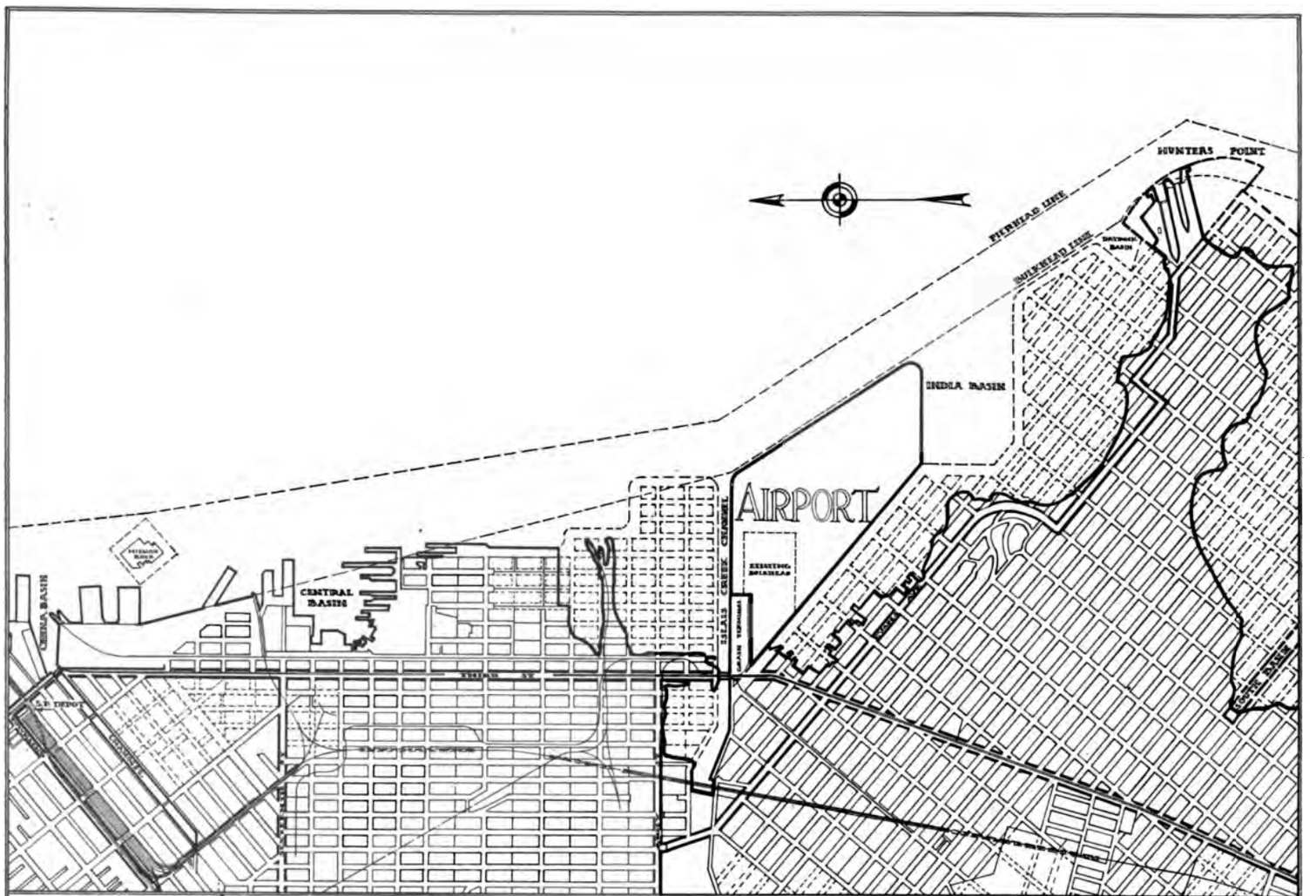
SITE B—CHINA BASIN.

Estimated Cost per Acre: $87,000—$109,000.

The development of an air terminal at some highly accessible point in the City would involve considerable expense as well as problems of safety; and it is very doubtful whether our air commerce in its present development could bring in a revenue proportionate to the cost of such a terminal. Any very accessible air terminal that might be built at a future time would probably have to be restricted to a very specialized kind of commercial service rather than be given over to the use of the public. Since the problem of what a highly accessible air terminal might be like is an interesting one, it is worthwhile to note one or two of the best suggestions that have been made with regard to this.

The scheme indicated on Map B-1, opposite this page, has been discarded by the writer as wholly impracticable, and the map is included merely for the purpose of illustrating the accessibility of the China Basin district to the center of the City. Probably the best suggestion for an air terminal in this vicinity is that of an elevated landing deck over the railroad freight yards South of China Basin. A platform on this sheltered site would enable air traffic to occupy an extremely accessible location without absorbing the use of the valuable land underneath. Such a structure would involve problems of smoke removal, illumination, etc., and it would have to be very solidly built. The heaviest American planes weigh as much as 18 tons and land at very high velocities. The cost of a platform built sufficiently solid to withstand the loads and impacts involved in the landing of airplanes would naturally depend very much upon the height and spacing of the supporting columns. On the freight yard site, where the structure need be but sufficiently high to clear the railway trains, and where the columns could be spaced at frequent intervals between the tracks, the cost of such a platform has been estimated to be in the neighborhood of $2.00 to $2.50 per square foot.

A second suggestion is that of a landing platform over some of the piers North of China Basin. A very interesting description of such a project by Mr. Fred Dohrmann, Jr., together with the designs prepared by Mr. Lewis P. Hobart, Architect, may be found in the January 1927 issue of "Pacific Commerce".



SCALE:
1" = 2500'
0' 2500'

MAP C-1
SHOWING LOCATION OF PROPOSED AIRPORT
ON THE ISLAIS CREEK, SAN FRANCISCO

MAR. 1931

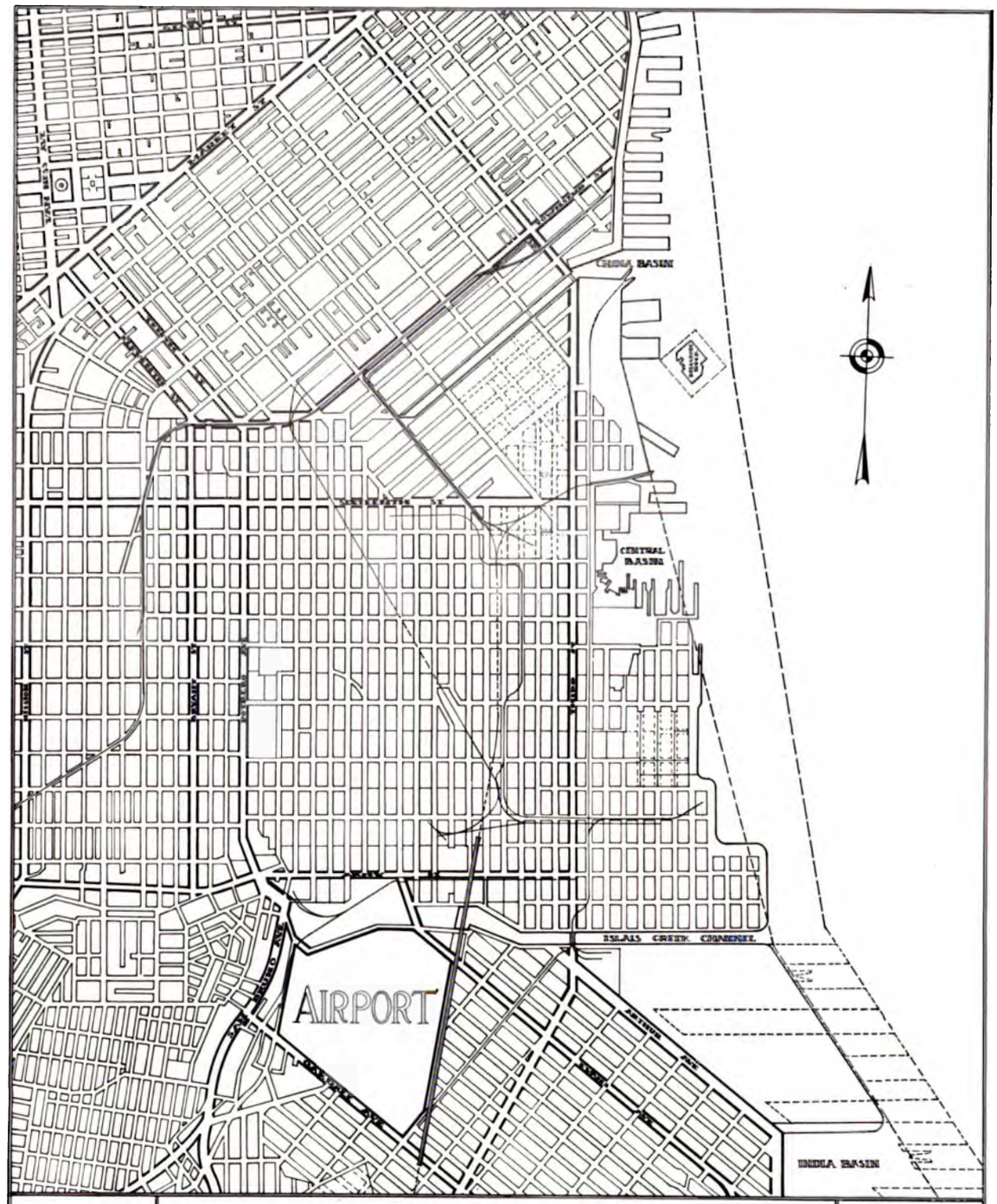
C. H. BALDWIN,
BALFOUR B'G. SF.

SITE C—STATE ISLAIS DEVELOPMENT.

	Class II Airport	Class I Airport
Total Area Required	106.5 Acres	176 Acres
Estimated Total Cost*	$3,195,000	$5,280,000
Estimated Cost per Acre*	$ 30,000	$ 30,000

The large area of tidelands owned by the State immediately South of the Islais Creek Channel and the Grain Terminal is one of the possible sites for an airport, but the cost of developing it would be very much greater than in the case of the Hunter's Point uplands, which are but one half mile South of the Islais site. This tract was purchased by the State in 1909 for harbor improvement, and has a total area of about 193 acres, of which about 40 acres have been filled in to date. Since the original price of this property was something like $4500 per acre, and since the cost per acre of filling it in and surfacing it is estimated to be from $20,000 to $25,000, the area, secured, reclaimed, and equipped, will represent a value of something like $30,000 for each acre. The conversion of this site into an airport moreover, would not seem to be feasible, since it forms a valuable part of the limited area still available for the State's future harbor and waterfront development.

* Secured, developed and equipped as an airport.



SCALE:
1" = 2500'
0' 1250'

MAP D-1
SHOWING LOCATION OF PROPOSED AIRPORT
ON THE ARMY-POTRERO SITE, SAN FRANCISCO.

APRIL 1931

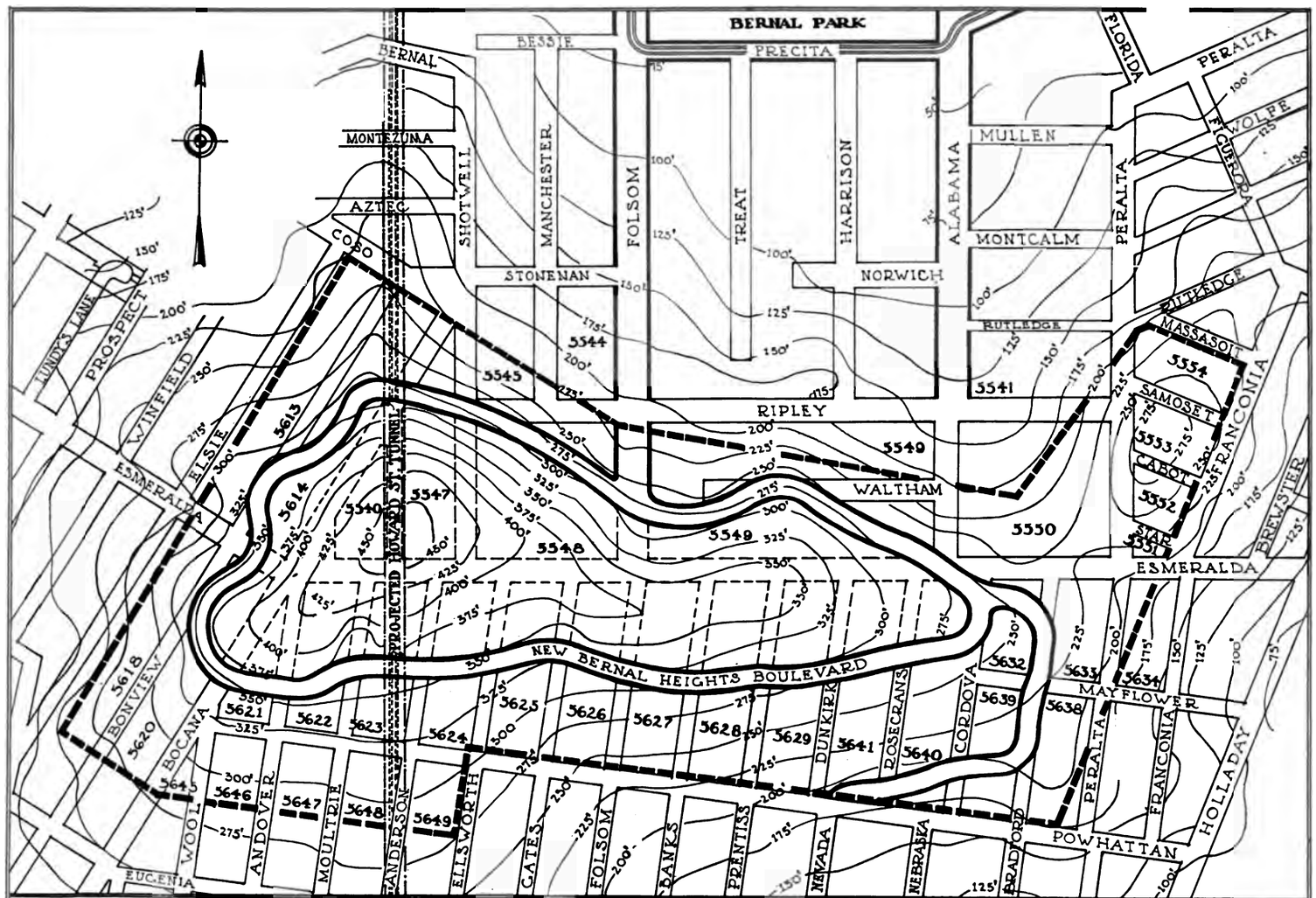
C. H. BALDWIN,
BALFOUR, BLDG. S.F.

SITE D—ARMY STREET AND POTRERO AVENUE

Total Area Required	138.6 Acres
Estimated Total Cost*	$3,625,000
Estimated Cost per Acre*	$ 25,500

The large flat tract South East of the junction of Army Street with Potrero Avenue is a possible site for an airport, but it would be very much less satisfactory from the standpoint of safety than any of the sites along the waterfront, and it would also be very expensive to acquire. The site is surrounded on all sides by built up property and is subject to unfavorable draughts coming down from the Bernal Heights, which rise sharply a few hundred feet to the West of the site. This area is a part of the old Islais Creek swamp, which has been gradually filled in and developed over a period of many years, and it is being held as a valuable site for industrial purposes.

* Secured, developed and equipped as an airport.



SCALE: 1" = 400'

0' 400'

MAP E-1
SHOWING LOCATION OF PROPOSED AIRPORT
AT BERNAL HEIGHTS, SAN FRANCISCO
PROPOSED BY JAS. W. DOHERTY

JUNE 1931
GRADING PLAN & DESIGN BY
L. M. KING, C.E.
C. H. BALDWIN,
BALFOUR BLDG., S.F.

SITE E—BERNAL HEIGHTS

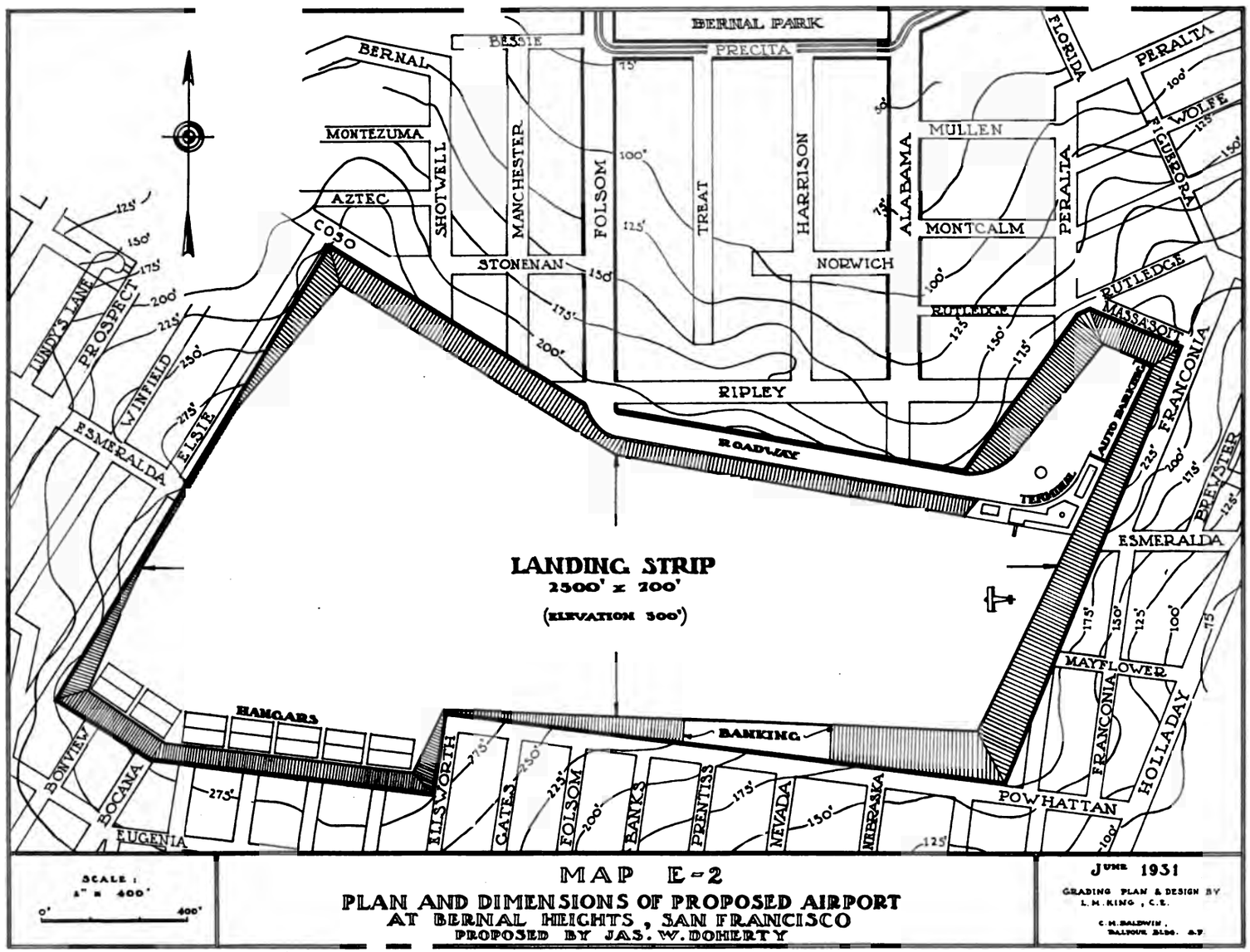
Proposed by Mr. James W. Doherty.

Total Area Required	62.7 Acres
Estimated Total Cost*	$1,908,000
Estimated Cost per Acre*	$ 30,900

The proposed landing field on the Bernal Heights, which are located at the South end of the Mission district and which rise at one point to an elevation of 450 feet, is restricted in area and, on the whole, very much less desirable from the point of view of safety than the sites along the waterfront. The site is surrounded by built up property on all sides and would be, from the point of view of present day requirements, a short and hazardous field. As one of the very few areas within the City, however, that are still available and large enough even for the operation of autogiros, the suggestion of Bernal Heights may be of real practical value. The details regarding the site, its cost, etc., were worked out with considerable care and thoroughness on the part of its author, to whom credit is due for a very timely and interesting suggestion.

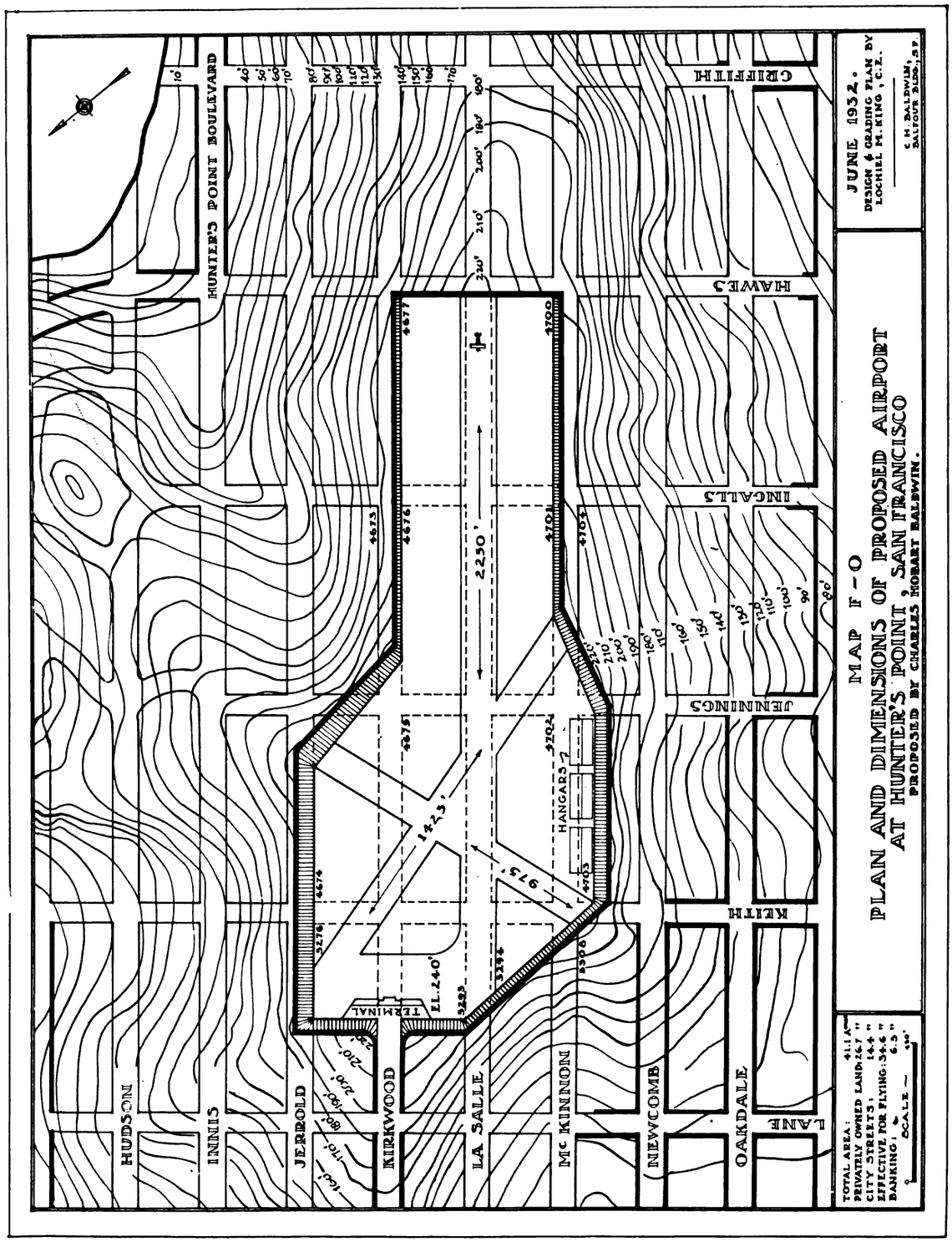
The proposed landing field at Bernal Heights would be formed by grading a flat table of sufficient area on the hill by the process of cutting and filling. By excavating down to the 300 foot contour, and by making use of a total area of

* Secured, developed and equipped as an airport.


BERNAL PARK
BESSIE
PRECITA
BERNAL
MONTEZUMA
AZTEC
COSO
SHOTWELL
MANCHESTER
FOLSOM
TREAT
HARRISON
ALABAMA
MULLEN
MONTCALM
NORWICH
STONENAN
RUTLEDGE
FLORIDA
PERALTA
WOLFE
IGUEROA
MASSASOIT
FRANCONIA
BREWSTER
ESMERALDA
MAYFLOWER
HOLLADAY
POWHATTAN
NEBRASKA
NEVADA
PRENTISS
BANKS
GATES
ELLSWORTH
EUGENIA
BOCANA
BONVIEW
ELSIE
WINFIELD
PROSPECT
LUNDY'S LANE
RIPLEY
ROADWAY
TERMINAL
AUTO PARKING
HANGARS
BANKING
LANDING STRIP
2500' x 200'
(ELEVATION 300')
SCALE:
1" = 400'
0'
400'
MAP E-2
PLAN AND DIMENSIONS OF PROPOSED AIRPORT
AT BERNAL HEIGHTS, SAN FRANCISCO
PROPOSED BY JAS. W. DOHERTY
JUNE 1931
GRADING PLAN & DESIGN BY
L. M. KING, C.E.
C. M. BALDWIN,
BALFOUR BLDG. S.F.

62.7 acres, a level area of 50.4 acres could be formed, the other 12.3 acres of the total area being required for banking. This excavation would involve a removal of 2,241,000 cubic yards of rock and sand at a probable cost of $1,300,000. Of the total area of 62.7 acres required for the airport, 40.6 acres are owned by the City in the form of lots and streets and in the tract recently condemned for building the Bernal Heights Boulevard; the remaining 22.1 acres of the property being privately-owned and assessed at $133,290. If we assume that the City authorities would set aside without cost all of the City property lying within the limits of the proposed landing field, the estimate of the total cost of the project would be limited to (A) to cost purchasing the private property; (B) the cost of the grading; and (C) the cost of preparing and equipping the field for airport purposes. Its total cost, as thus estimated, including an allowance of 10% extra, is $1,908,000.†

† If we limit the estimate of the cost of this project to items (A) and (B), its estimated cost is $1,633,225.



Suggested Unit No. One of Airport Development at Hunter's Point.

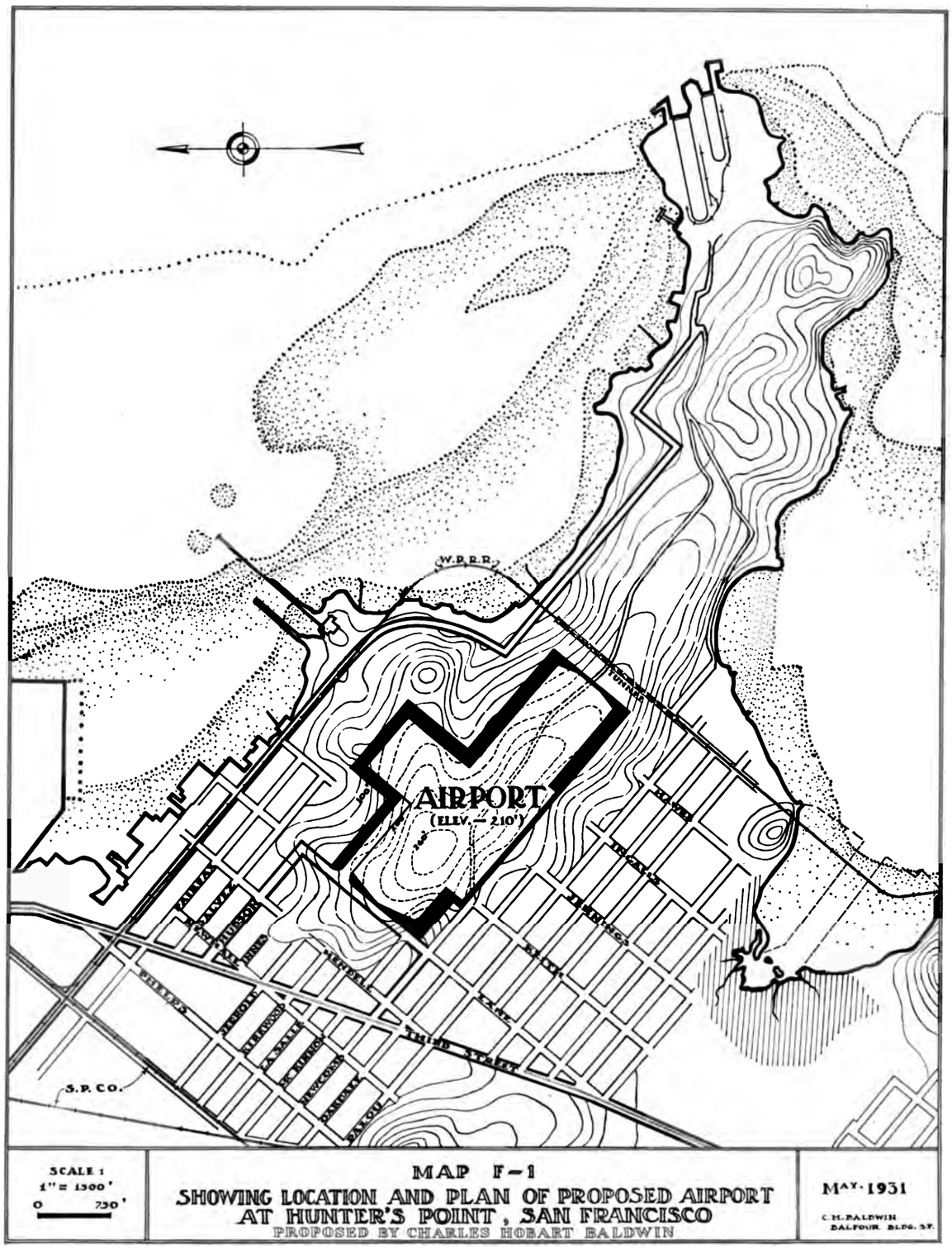
SITE F—HUNTER'S POINT

Proposed by Charles Hobart Baldwin.

	Small but Adequate Airport	Medium Sized Airport	Large Airport
Total Area Required	41.1 Acres	92.3 Acres	178.6 Acres
Estimated Total Cost*	$252,800	$1,078,700	$2,453,200
Estimated Cost per Acre*	$ 6,150	$ 11,680	$ 13,700

The development of an airport at Hunter's Point, which can be accomplished by grading down and leveling a sufficient area on the Hunter's Point uplands, is preferable—from the standpoints of convenience, of availability at the present time, and of economy—to any of the other air projects that have been suggested. The two-mile arm of land stretching East and West at Hunter's Point has its axis practically parallel to the direction of the prevailing wind, and provides a sheltered and natural location for the safe operation of airplanes and seaplanes inside the City and County. The Hunter's Point site, moreover, is approximately one mile nearer to the heart of San Francisco by road than the proposed site at Goat Island will eventually be by road and by bridge, being but 3.8 miles distant by road from either Third and Market or Market and Van Ness,—from either of which two points it can be reached by automobile in a matter of 8-10 minutes. The Hunter's Point site should be secured for an airport at the present time since it can be developed and made useful at once, whereas the proposed site at Goat Island (which should also be a very useful and valuable location for air traffic) will not be useful or worth developing until the completion of the great Bay bridge five or six years hence,—by the end of which time our air traffic will very likely have grown to such an extent as to make necessary the development of the additional landing field area that will then be available at Goat Island. The Hunter's Point site, on the other hand, has a great advantage over all of the other available sites from the point of view of economy, inasmuch as its per acre cost of development, ($6,150-$13,700) is but a fraction of the cost at Goat Island, which is the next cheapest site.

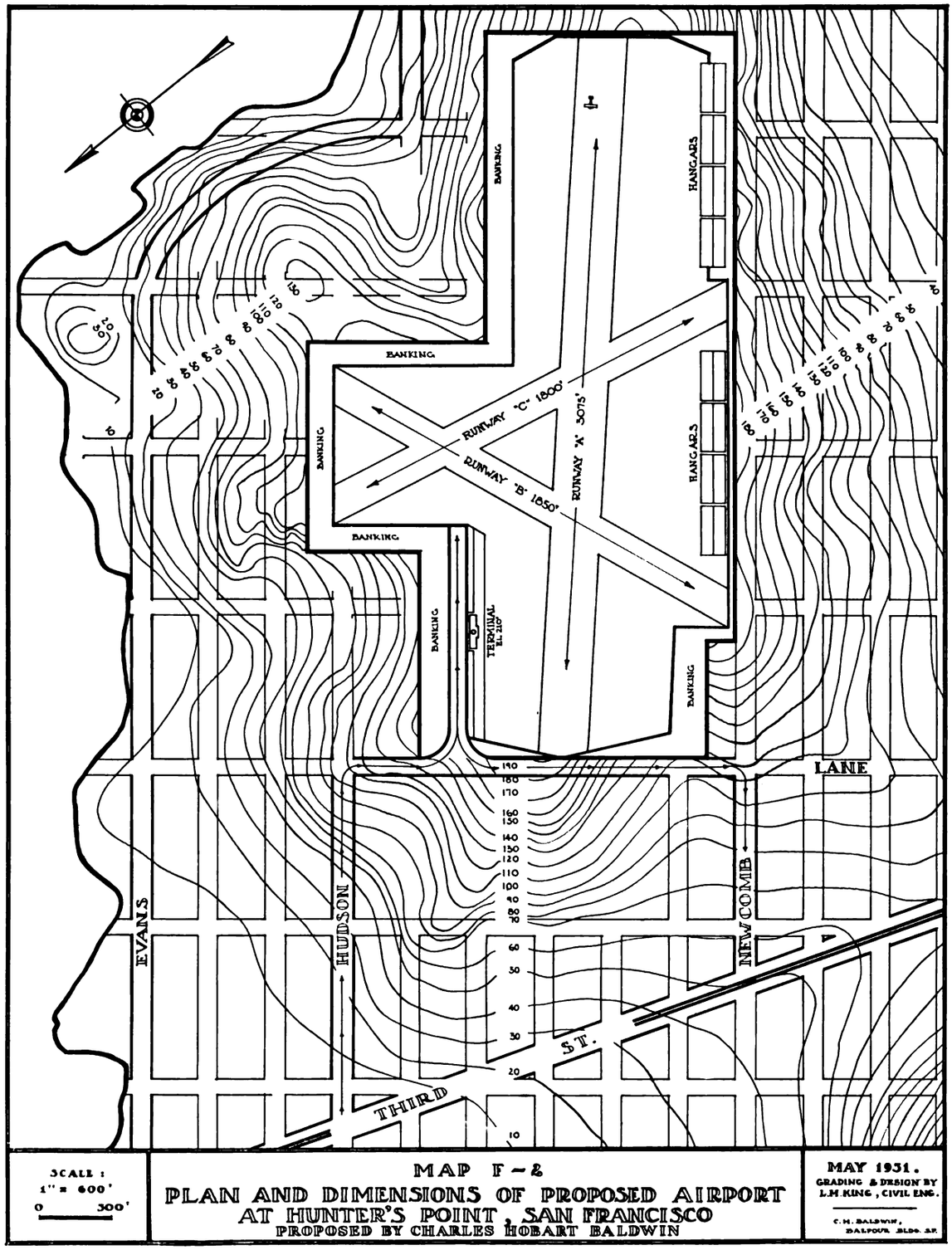
* Secured, developed and equipped as an airport.



Suggested Second Development: Expansion of Unit No. One Into a 92.3 Acre Airport.

The development of the project at Hunter's Point is faced with one possible difficulty in that it involves securing and assembling at a fair price a very large number of small private land holdings on the hill,—a feature which would not be involved in the case of some of the other sites (particularly in the cases of the Marina and of Goat Island, for instance) where all of the necessary land is now under the jurisdiction of public authorities. The uplands at Hunter's Point, on the other hand, are idle and practically worthless for any industrial or other important development in their present condition on account of the 260 foot hill that rises sharply a few hundred feet East of Third Street. If the various private realty parcels at this site could be collected together now at a fair price and be set aside for the development of an airport, the City would be able to acquire an airport more cheaply and more quickly here than in the case of any of the other suitable sites on the Peninsula or at Goat Island. It should be made clear that the Hunter's Point site is not suggested as a mere landing field or service depot; the site is sufficient in area to create a major airport and to satisfy the future needs of an air industry inside of the City and County. It could be gradually expanded, if necessary, by regrading and filling in the tidelands adjoining the property—to almost any area that might ultimately be required.

The ownership of the Hunter's Point uplands is divided between private owners, on the one hand, and the City, which owns various blocks and lots and the considerable area that has been set aside for the development of future streets. A considerable portion of the private land is controlled by several large owners, but the remainder is held by a huge number of small owners—perhaps two or three hundred in all. In estimating the cost of acquiring the necessary land at Hunter's Point, it is assumed that it will be necessary to purchase all of the private property and all of the City-owned blocks and lots as well, but that the City will close the (as yet ungraded) streets passing between the various blocks without any cost. The total cost of an airport at Hunter's Point depends upon the extent of the land area secured and developed, and an estimate as to the cost is submitted

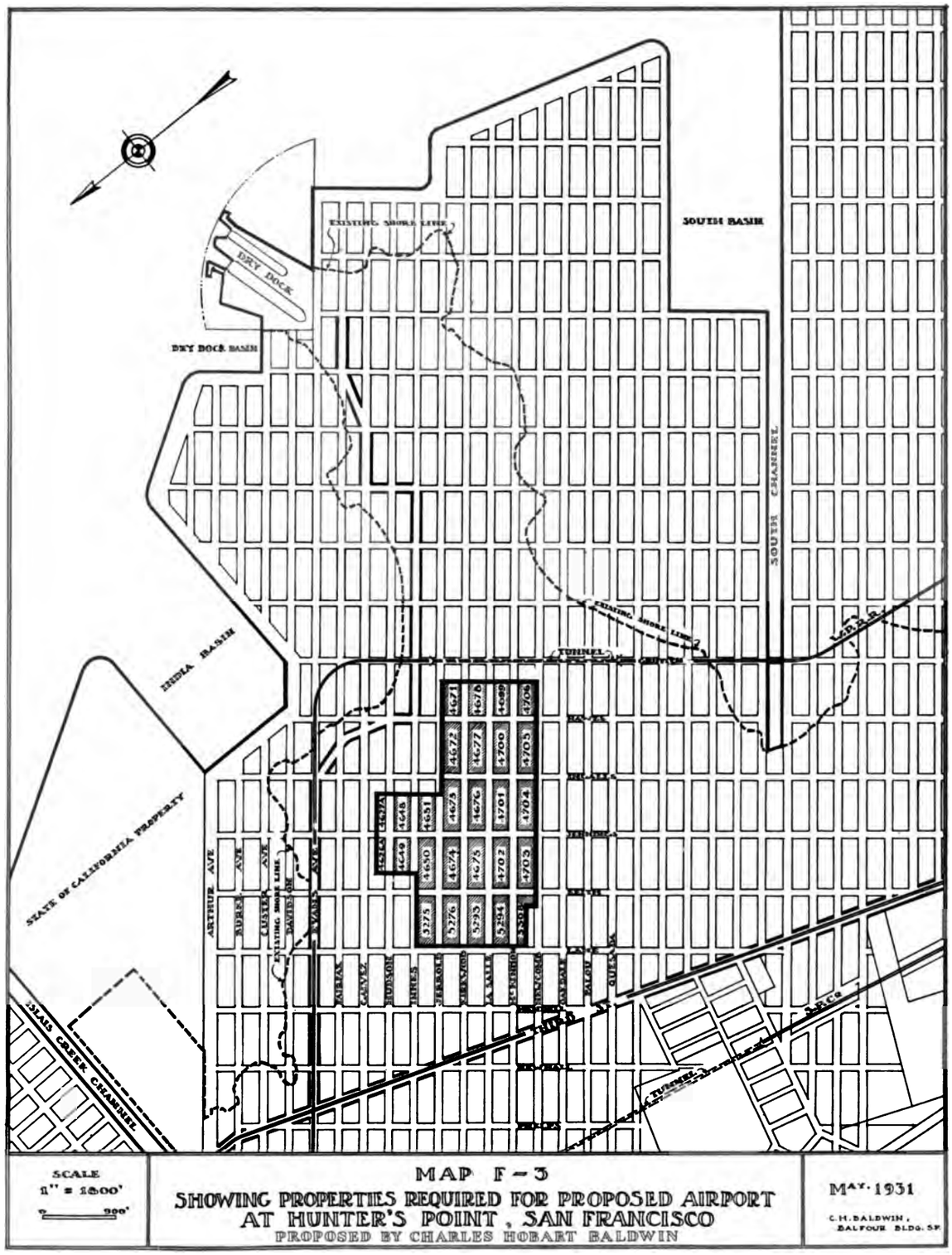


Suggested Second Development: Expansion of Unit No. One Into a 92.3 Acre Airport.

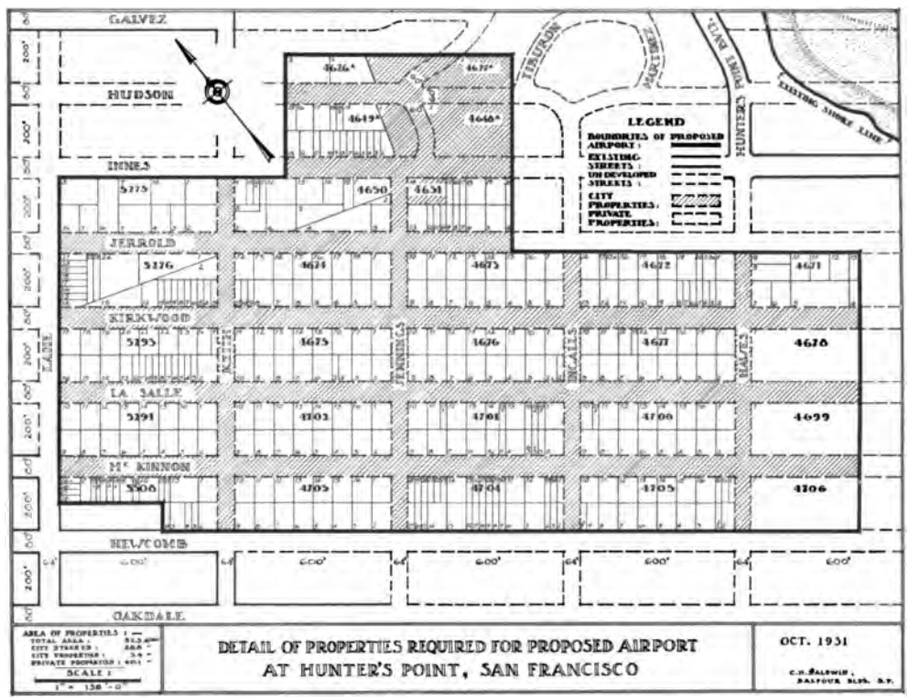
in the case of (1) a small sized airport, covering 41.1 acres of land; (2) a medium sized airport, covering 92.3 acres of land; and (3) a large sized airport, covering approximately 178.6 acres.

A small-sized airport, formed by grading a level area on the 240 foot contour of the hill, is illustrated in Map F-0 herewith. This airport would occupy a total area of 41.1 acres, of which approximately 34.6 acres would be effective as landing area, the remaining 6.5 acres being required for banking and parking. This airport would provide a runway 2250 feet long in the direction of the prevailing wind and cross runways, which, as shown on the map, are somewhat short, but could be lengthened without great difficulty. The land area required consists of 14.4 acres of ungraded streets, which would have to be closed, and of 26.7 acres of private land, which would have to be purchased. The assessed value of all the private property amounts to $24,110 ($23,860 for the land and $250 for the improvements), and the annual revenue that the City derives in taxes from this 41.1 acre tract is scarcely more than $1000. If we assume that all the private property could be purchased at two and one half times its assessed value, the total cost of the land would be $60,275. The major item of cost in the preparation of this airport would consist of the grading, involving an excavation of 325,000 cubic yards of rock and sand, at a probable cost of 25c per cubic yard (at the present time), amounting to $81,250. The cost of additional preparations and equipment for the site,—allowing, fairly $2000 for each acre of the area effective for landing,—would amount to $69,200. Thus these totals plus 20% allowance for contingencies, amounts to $252,860, which will provide for the first of the three projects.

A medium-sized airport, formed by grading a level area on the 210 foot contour of the hill, is illustrated in Maps F1, F2, F3, F4 and the first property detail map, herewith. This airport would occupy a total area of 92.3 acres, of which approximately 73 acres would be effective as landing area, the remaining 19.3 acres being required for banking, parking and a road. This airport would provide

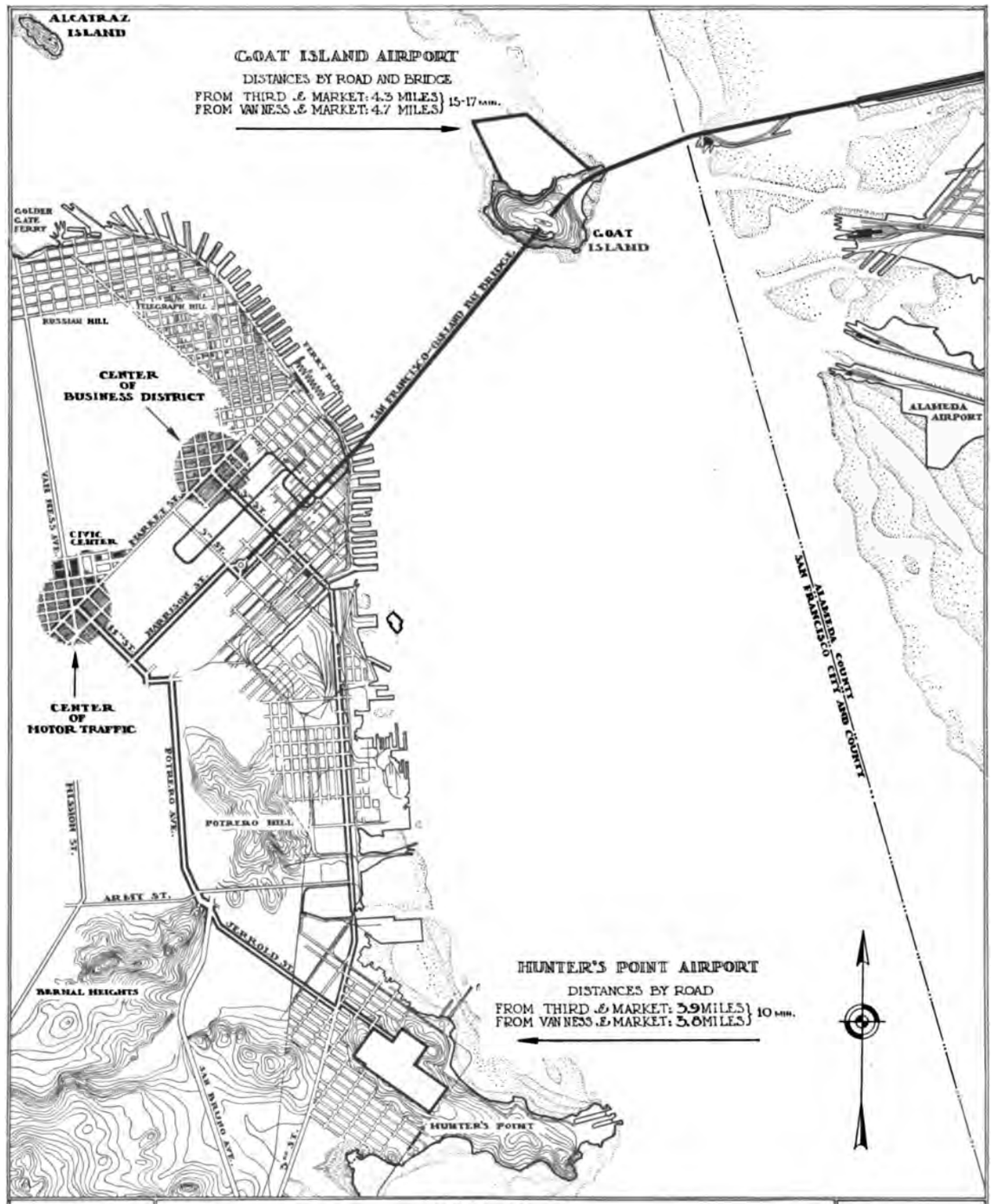


Suggested Second Development: Expansion of Unit No. One Into a 92.3 Acre Airport.



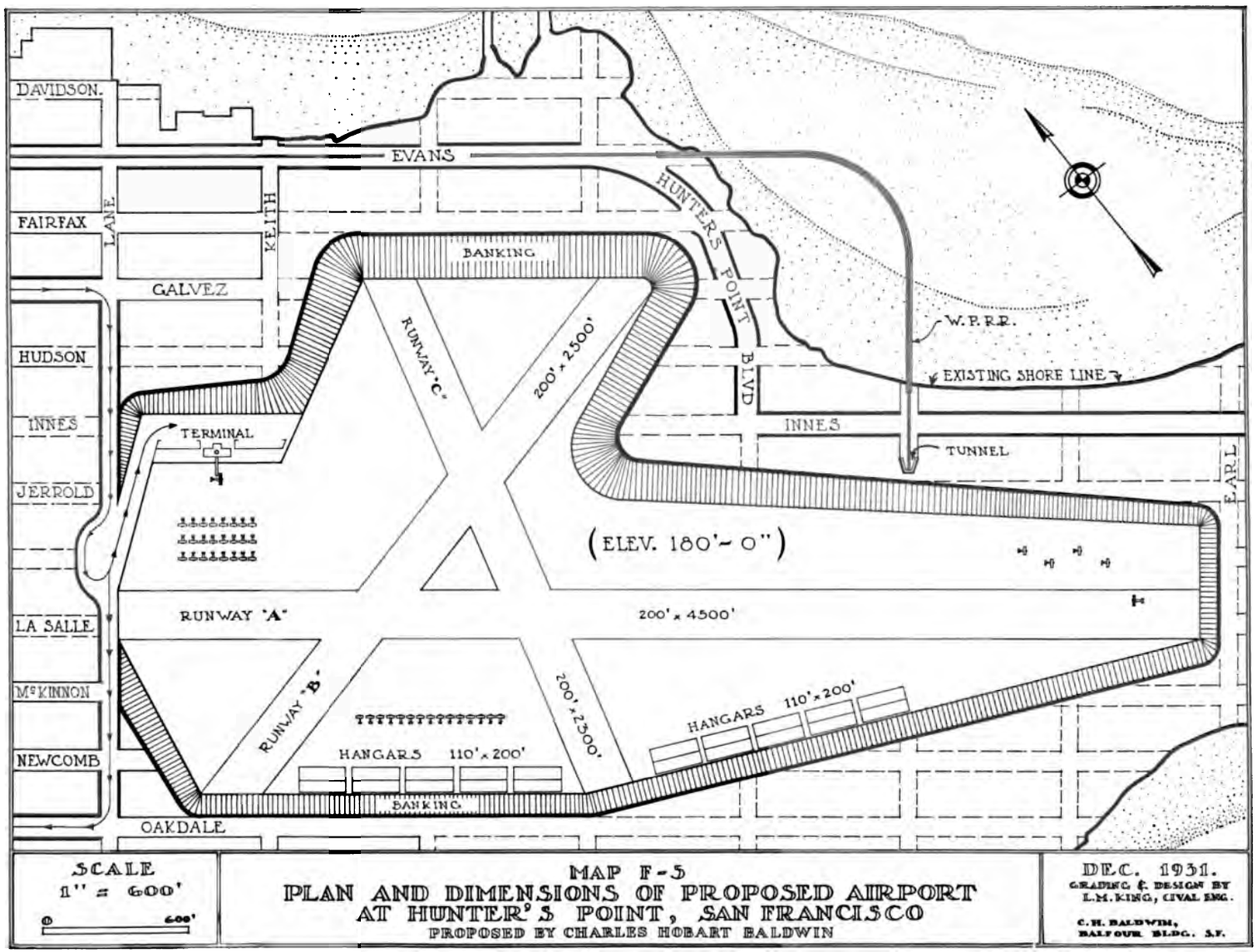
Suggested Second Development: Expansion of Unit No. One Into a 92.3 Acre Airport.

a runway 3075 feet long in the direction of the prevailing wind, with cross runways 1800 and 1850 feet long. The land area required consists of 28.8 acres of ungraded streets, which would have to be closed; and of 3.4 acres of City property, and 60.1 acres of private property, which would have to be bought. The assessed value of all of the private property amounts to $74,315 ($62,365 for the land and $11,950 for the improvements), and the annual revenue that the City now

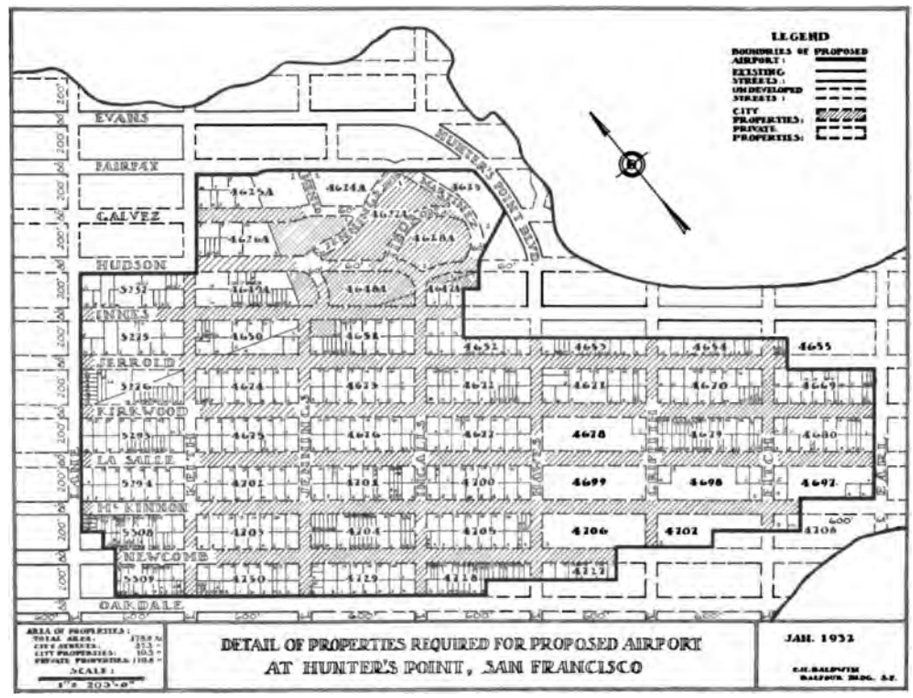

ALCATRAZ ISLAND
GOAT ISLAND AIRPORT
DISTANCES BY ROAD AND BRIDGE
FROM THIRD & MARKET: 4.3 MILES
FROM VAN NESS & MARKET: 4.7 MILES
15-17 MIN.
GOAT ISLAND
GOLDEN GATE FERRY
TELEGRAPH HILL
RUSSIAN HILL
CENTER OF BUSINESS DISTRICT
SAN FRANCISCO-OAKLAND BAY BRIDGE
ALAMEDA AIRPORT
CIVIC CENTER
MARKET ST.
MISSION ST.
VAN NESS AVE.
CENTER OF MOTOR TRAFFIC
ALAMEDA COUNTY
SAN FRANCISCO CITY AND COUNTY
POTRERO AVE.
POTRERO HILL
MISSION ST.
ARMY ST.
TERRY OLD ST.
BERNAL HEIGHTS
SAN BRUNO AVE.
HUNTER'S POINT
HUNTER'S POINT AIRPORT
DISTANCES BY ROAD
FROM THIRD & MARKET: 3.9 MILES
FROM VAN NESS & MARKET: 3.8 MILES
10 MIN.
SCALE: 1" = 3000'-0"
0' 1500'
MAP F-4
SHOWING LOCATION OF PROPOSED AIRPORTS
AT HUNTER'S POINT AND GOAT ISLAND, SAN FRANCISCO
NOV. 1931
C.H. BALDWIN, BALFOUR BLDG. S.F.

derives in taxes from this 92.3 acre tract and from the improvements upon it is scarcely more than $3200. If we assume that all of the private property could be purchased at two and one half times its assessed value and that the City property could be purchased at five cents per square foot, the total cost of acquiring all of the necessary land would be $193,180. The major item of cost in the preparation of this airport would consist of the grading, involving an excavation of 1,866,000 cubic yards of rock and sand, at a probable cost of 30 cents per cubic yard, amounting to $559,800. The cost of additional preparations and equipment for the site—allowing, fairly $2000 for each acre of the area effective for landing—would amount to $146,000. Thus, these totals plus 20 per cent allowance for contingencies, amounts to $1,078,700, which will provide for the second of the three projects.

A large and, on the whole, very much more satisfactory airport than either of the two schemes described above could be formed by grading down to the 175-foot contour of the hill, as illustrated upon Map F5 and the second property detail map, herewith. This airport would cover a total area of 178.6 acres, of which approximately 140 acres would be effective as landing area, the remaining 38.8 acres being required for banking, parking and roads. This airport would provide a runway 4500 feet long in the direction of the prevailing wind and cross runways of 2500 and 2350 feet. The land required consists of 57.3 acres of ungraded streets, which would have to be closed; and of 10.5 acres of City property, and 110.8 acres of private property, which would have to be bought. The assessed value of all of the private property amounts to $156,600 ($118,700 for the land and $37,900 for the improvements), and the total revenue that the City now derives in taxes from this 178.6 acre tract and from the improvements upon it is scarcely more than $6,200. Assuming, again, that the private property could be purchased at two and one half times its assessed value and that the City property could be purchased at 5 cents per square foot, the total cost of acquiring all of the necessary land would be $414,350. The major item of cost in the preparation of this airport would

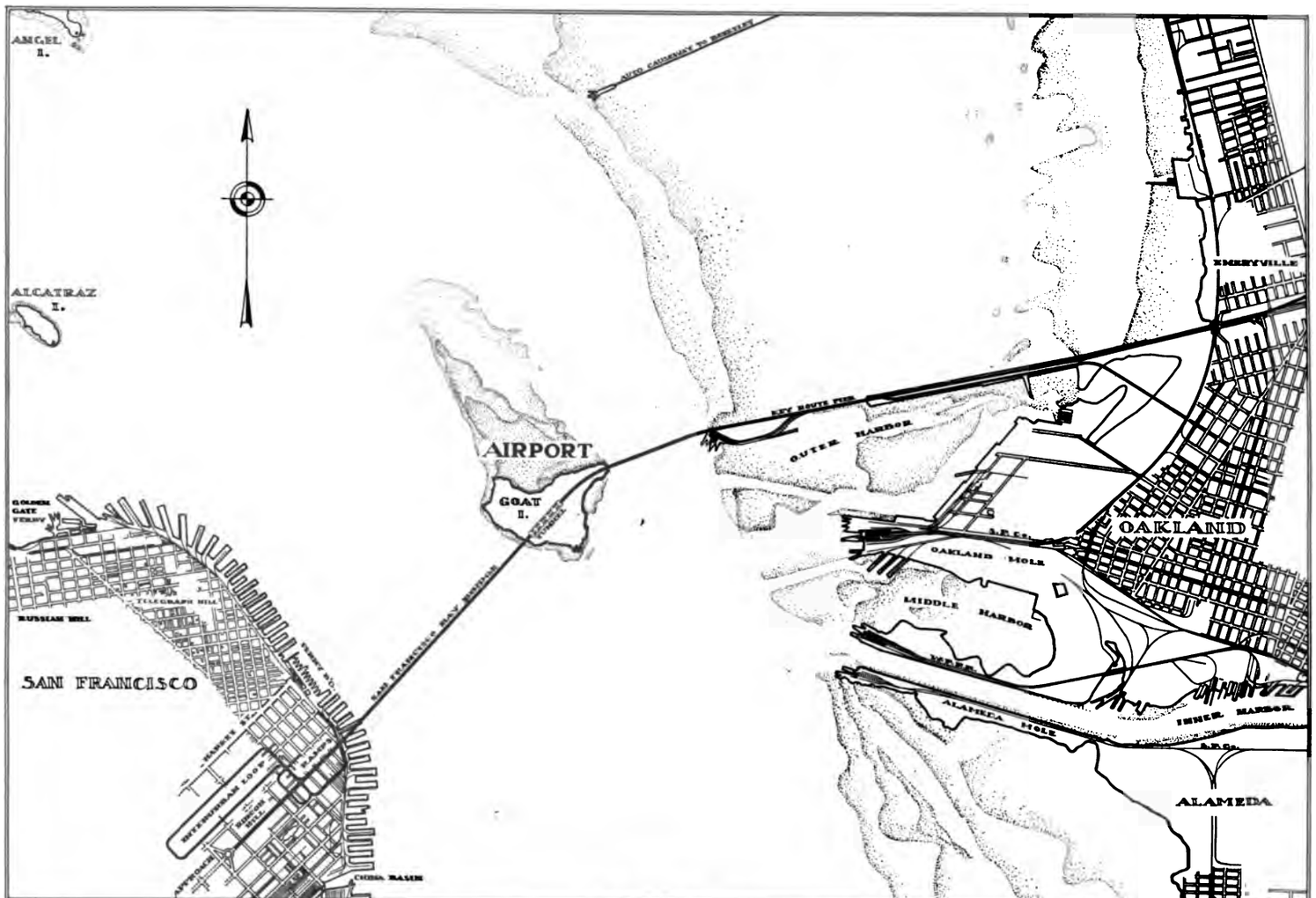


Suggested Alternative Second Development: Expansion of Unit No. One Into a 178.6 Acre Airport.



Suggested Alternative Second Development: Expansion of Unit No. One Into a 178.6 Acre Airport.

consist of the grading, involving an excavation of about 4,500,000 cubic yards of rock and sand, at a probable cost of 30 cents per cubic yard, amounting to $1,350,000. The cost of additional preparations and equipment for the airport—allowing, fairly, $2000 for each acre of the area effective for landing—would amount to $280,000. Thus these totals, likewise allowing 20 per cent extra for contingencies, would amount to $2,453,200, and will provide the City with a major airport, suitable for San Francisco needs for a good many years.



SCALE: 1" = 5000'
0 — 5000'

MAP G-1
SHOWING LOCATION OF AIR TERMINAL AT GOAT ISLAND.
PROPOSED BY MAJOR H. S. BURWELL, U.S.A.

MAY 1931
C.H. BALDWIN, BALFOUR BLDG., S.F.

SITE G—GOAT ISLAND

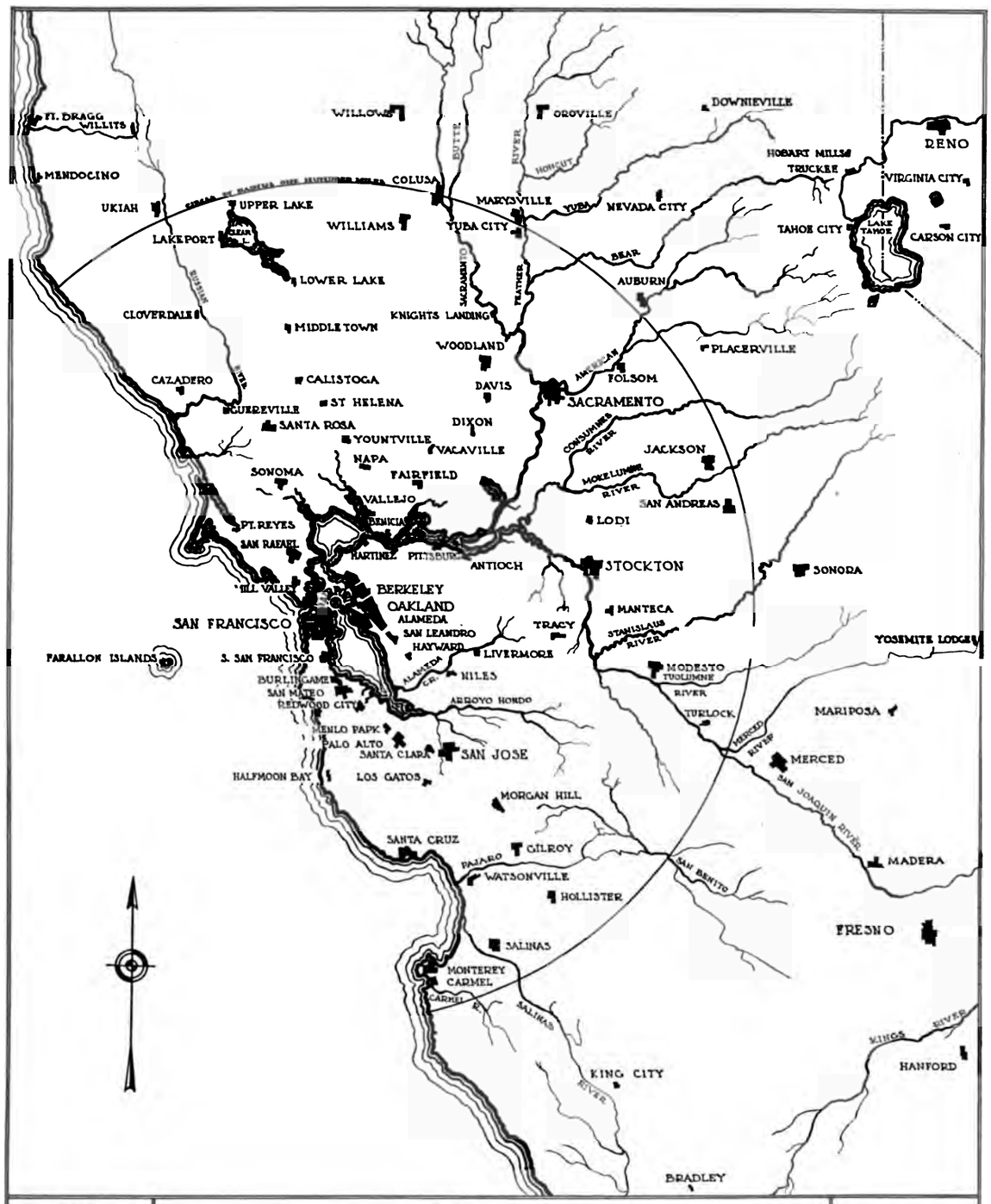
Proposed by Major Harvey S. Burwell, A. C.

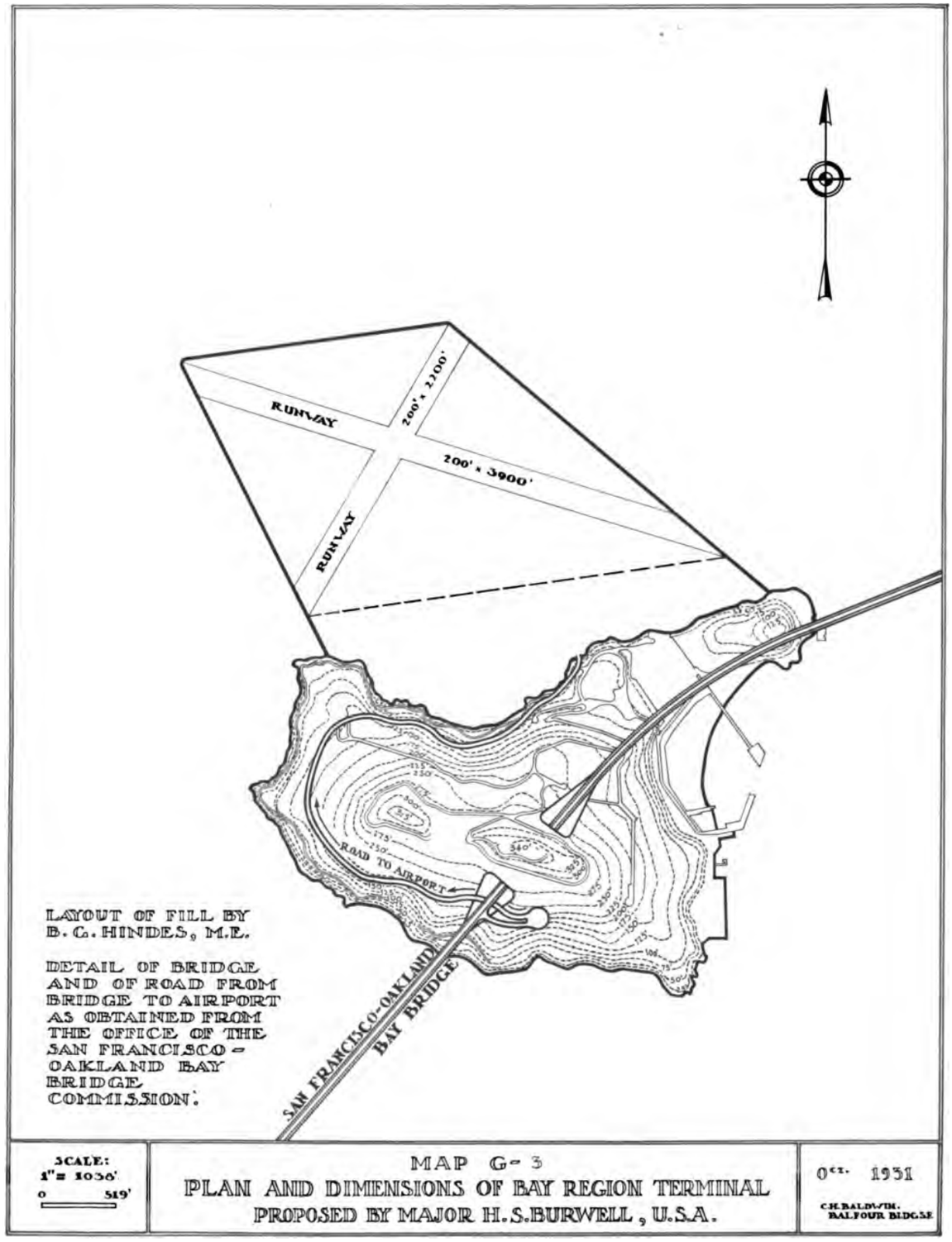
Total Area Required	140 Acres
Estimated Total Cost*	$3,223,000
Estimated Cost per Acre*	$ 23,000

The picturesque site on the tidelands North of Goat Island, suggested by Major Harvey S. Burwell, A. C. as the appropriate location for a future terminal airport to serve the entire Bay district, would appear to have every possible advantage and merit,—though the project is one which can not very well be realized for a number of years, until the bridge is completed, and therefore cannot be regarded as a solution for the City's aviation needs of the present time. The site, however, will someday become readily accessible to the chief centers of population on the Bay,—with the completion of the great Bay bridge,—and would seem to be the ideal place for a unified terminal for commercial air lines serving the Bay district. While the Goat Island site will become readily accessible both to San Francisco and to the cities of the East Bay, it will be slightly less accessible to San Francisco itself than either the Marina or the Hunter's Point sites,—both of which sites should be secured for general purposes of aviation in the City and, especially, for purposes of private aviation. Private aviation naturally requires the choicest and most convenient airport facilities, and should be given precedence in this respect over commercial service,—just as private automobiles always enjoy the better roads and the right-of-way over trucks, trailers, etc.

The airport at Goat Island would be formed by enclosing a part of the shoal area North of the Island with a bulkhead, and by filling this in to a desired elevation with material dredged from the Bay. The engineering work for this site would include—according to the figures of Mr. Lochiel M. King, C. E.—building 7200 linear feet of seawall, at a cost of $1,300,000; dredging approximately 5,000,000 cubic yards of sand, at a cost of $750,000; and providing the necessary surfacing at a cost of about $300,000. To this would have to be added the cost of equipping the field, estimated at $280,000, and of constructing a road, about one mile in length, leading from the bridge around the Island to the airport, whose cost is estimated to be $300,000. If we add to the total of the above items 10% extra to take care of unforeseen expenses, the estimated total cost of the project will be $3,223,000.

* Developed and equipped as an airport, and provided with a road connecting the airport with the bridge.


FT. BRAGG
WILLITS
MENDOCINO
UKIAH
UPPER LAKE
LAKEPORT
LOWER LAKE
CLOVERDALE
MIDDLETOWN
CAZADERO
CALISTOGA
GUERNEVILLE
ST HELENA
SANTA ROSA
YOUNTVILLE
NAPA
SONOMA
VALLEJO
PT. REYES
SAN RAFAEL
MARTINEZ
PITTSBURG
ANTIOCH
BERKELEY
OAKLAND
ALAMEDA
SAN LEANDRO
HAYWARD
SAN FRANCISCO
FARALLON ISLANDS
S. SAN FRANCISCO
BURLINGAME
SAN MATEO
REDWOOD CITY
MENLO PARK
PALO ALTO
SANTA CLARA
SAN JOSE
HALFMOON BAY
LOS GATOS
MORGAN HILL
SANTA CRUZ
GILROY
WATSONVILLE
HOLLISTER
SALINAS
MONTEREY
CARMEL
KING CITY
BRADLEY
WILLOWS
COLUSA
WILLIAMS
YUBA CITY
MARYSVILLE
OROVILLE
KNIGHTS LANDING
WOODLAND
DAVIS
DIXON
VACAVILLE
FAIRFIELD
SACRAMENTO
FOLSOM
PLACERVILLE
AUBURN
JACKSON
SAN ANDREAS
LODI
STOCKTON
SONORA
MANTECA
TRACY
LIVERMORE
NILES
ARROYO HONDO
MODESTO
TURLOCK
MARIPOSA
MERCED
MADERA
FRESNO
HANFORD
YOSEMITE LODGE
DOWNIEVILLE
HOBART MILLS
TRUCKEE
NEVADA CITY
TAHOE CITY
LAKE TAHOE
CARSON CITY
RENO
VIRGINIA CITY
BUTTE
RIVER
SACRAMENTO
FEATHER
YUBA
BEAR
AMERICAN
COSUMNES RIVER
MOKELUMNE RIVER
STANISLAUS RIVER
TUOLUMNE RIVER
MERCED RIVER
SAN JOAQUIN RIVER
SAN BENITO
PAJARO
ALAMEDA CR.
CARMEL R.
SALINAS
KINGS RIVER
SCALE:
1" = 36 MI.
0 6 12 18
MAP G-2
AREA WITHIN HUNDRED MILES OF BAY REGION TERMINAL
PROPOSED BY MAJOR H.S. BURWELL, U.S.A.
MAY. 1931
C.H. BALDWIN,
BALFOUR BLDG. S.F.


RUNWAY
200' x 2100'
200' x 3900'
RUNWAY
ROAD TO AIRPORT
SAN FRANCISCO-OAKLAND BAY BRIDGE
LAYOUT OF FILL BY B. G. HINDES, M.E.
DETAIL OF BRIDGE AND OF ROAD FROM BRIDGE TO AIRPORT AS OBTAINED FROM THE OFFICE OF THE SAN FRANCISCO - OAKLAND BAY BRIDGE COMMISSION.
SCALE: 1" = 1056'
0 519'
MAP G-3
PLAN AND DIMENSIONS OF BAY REGION TERMINAL PROPOSED BY MAJOR H. S. BURWELL, U.S.A.
Oct. 1931
C.H. BALDWIN. BALFOUR BIDGSE

APPENDIX I

Growth of Scheduled Passenger Air Commerce in the Bay Region, and Distribution of this Commerce Among the Various Airports Serving San Francisco.

N. B. The figures below represent the total number of passenger arrivals and departures on scheduled air lines at each of the airports of the Bay region where such traffic has occurred during the last four years, as obtained from the official records maintained at the various airports. Since some of the airport records for the earliest years were not altogether complete, the writer, through the courtesy of various air transport operators and airport officials, has supplemented the official records above referred to by data obtained from other sources. It was found, incidentally, that the figures obtained from these outside sources checked almost exactly with the figures filed at those airports which have maintained the most complete and accurate records of their traffic.

Total Number of Passenger Arrivals and Departures by All Scheduled Air Lines

Calendar Years	A At Mills Field (Established in May, 1927)	B At Oakland Municipal Airport (Established in June, 1927)	C At Alameda Airport (Established in Sept. 1928)	D† At San Francisco Bay Airdrome (Established in July, 1930)	E† Total of A, B, C, D	F At the Amphibian Plane Terminals
1928—2nd half	2,572	3,193	.....	.....	5,765	.....
1929	2,676	10,006	8,220	.....	20,902	.....
1930	1,474	12,848	8,288	9,643	32,253	60,287
1931	11,507*	5,826	0	33,509	50,842	19,070
1932—1st half	4,097*	3,251	0	20,231	27,579	7,668
Totals	22,326	35,124	16,508	63,383	137,341	87,025

† This does not include the local commuter passengers carried on the amphibian planes of the Air Ferries Ltd. and of Varney Speed Lines, the figures of which are given separately in Column F.

* With the completion of the San Francisco Bay Airdrome in July, 1930, Mills Field became entirely idle as regards scheduled air transport service after July 1930, and the Alameda Airport became idle after October 1930, and has remained so ever since. In order to make a showing of some kind of activity at the expensive airport at Mills Field, our officials tried to stimulate air traffic by artificial means. Accordingly, when the Century Pacific Lines Ltd. came to the Bay Region toward the middle of 1931, the City induced the new line to use Mills Field by offering it the use of the field and hangars without the usual charges. In spite of this subsidy, however, the Century Pacific Lines Ltd. after ten months went out of business, and Mills Field is again entirely idle as regards any real aviation business.

APPENDIX II

Note on the Volume of Air Mail Passing Through the Oakland Municipal Airport.

N. B. Air mail service in the Bay region over the transcontinental route commenced on Sept. 8th, 1920, and on September 15th, 1926, the coastwise route was established. This service was at first operated from San Francisco (i. e., from Crissy Field), though the Government, in July 1925, established a landing field also at Concord. After the Post Office had turned over the operation of the air mail service to private contractors, on July 1st, 1927, an attempt was made to use Mills Field for air mail, but the field was found to be unsuitable for this purpose. On Dec. 15th, 1927, the air mail service became established at the Oakland Municipal Airport, where it has remained ever since,—though some of the planes continued landing at Crissy Field until as late as Oct. 15th, 1930.

TABLE I

Pounds of Air Mail Transported Away from the Bay Region. (Figures from the U. S. Post Office, Oakland Municipal Airport.)

Calendar Years	A Number of Pounds of Air Mail	B % Increase of A
1931—First half	188,800	.....
1932—First half	209,168	10.8
1931—Whole year	418,451	.....

N. B. The total number of pounds of air mail carried *both to and from* the Bay region was, according to officials of the Post Office, approximately twice the amount of the above figures. Thus the total for the year 1931 amounted to about 837,000 pounds, or approximately 8.7% of the total of 9,643,211 pounds that were carried over the domestic air routes of the United States, at a cost of $19,900,251.

APPENDIX III

Growth of Express and Freight Poundage on Scheduled Air Transport Lines.

N. B. Unfortunately no accurate figures are available with regard to the growth of air express and freight service in the Bay region. This service has been carried on in the Bay region since Sept. 1st, 1927,—chiefly by the Railway Express Agency, operating over the United Air Lines: but some other companies are also engaged in this service. This growing business, like all of San Francisco's air business, (except for amphibian service at Pier 5 on the Embarcadero) is carried on altogether in the airports of the East Bay, and none of it at all at Mills Field. The growth of air express and freight service over scheduled lines in the United States may be seen from the following figures:

TABLE I

Pounds of Air Express and Freight Carried on Scheduled Lines in the United States. (Department of Commerce Figures.)

Calendar Years	A Pounds of Express and Freight Carried	B % Increase of A	Calendar Years	A Pounds of Express and Freight Carried	B % Increase of A
1926	3,555	.....	1929	257,443	18
1927	49,959	1,277	1930	468,571	82
1928	216,644	335	1931	1,151,348	145

APPENDIX IV

List of the Airports That were Active in the Bay Region as of September 1, 1932, and of the Aircraft and Personnel That were Operating at Each of Them.

N. B.—The list below includes only the airports that were actually in operation at the beginning of September or that were under construction, such as the Federal Government projects, numbered 4, 11 and 17 below in the order of their proximity to the center of San Francisco. Airports that enjoyed no regular traffic, and projects that were not being developed, are omitted from the list.

Names of Airports in the order of their distance from center of San Francisco	Airline Distance from Center of S. F.	Located at, or Near	Classification of Airport	Land Owned by	Airport Operated by*	Area Now Developed (Acres)	Area Available for Future Developm't (Acres)	No. of Hangars	*Planes Based at Airport	No. of Persons Regularly Stationed at Airport
1—Air Ferries Terminal, San Francisco	1	Pier 5, Embarcadero	Amphibian Base	State of Calif.	Varney Speed Lines	.....	.....	0	0	3
2—Crissy Field	3	Presidio of S. F.	U. S. Army Observ. Depot	U. S. Army	U. S. Army	28	?	4	26	‡
3—Alameda Airport	4.6	Alameda Mole	Commercial	City of Alameda	Curtiss-Wright Flying Service	170	364	11	27	19
4—Benton Field	5.8	Alameda Mole	U. S. Army Air Corps Sup. Base	U. S. Army	U. S. Army	.....	1100	0	0	§
5—S. F. Bay Airdrome	6.8	Inner Harbor Tunnel, Alameda	Commercial	Univ. of Calif.	S. F. Bay Airdrome, Inc.	232	232	2	45	60
6—Berkeley Airfield	8.5	2 miles W. of U. C. Stadium	Commercial	City of Berkeley	T. S. Neilson	20	45	1	2	4
7—Oakland Mun. Airport	10.8	6 Miles S. of Center of Oakland	Municipal	City of Oakland	Oakland Bd. of Port Commissioners	350	845	5	84	100
8—Mills Field ("S. F. Airport")	11.2	5½ Miles NW. of San Mateo	Municipal	Being Purchased by City of S. F.	City of S. F.	170	550	4	22	26
9—San Rafael Airport	15.5	3½ Miles NE. of San Rafael	Commercial	E. Walker Estate	R. Scherzer	80	.....	1	3	1
10—San Mateo Airport	18.3	2 Miles SE. of San Mateo	Commercial	Calif. Air Terminals, Inc.	Curtiss-Wright Flying Service	141	380	1	13	5
11—Hamilton Field	19.6	Ignacio, Marin County	U. S. Army Bombing Base	U. S. Army	U. S. Army	.....	859	0	0	§
12—San Carlos Airport	20.8	¼ Mile SE. of San Carlos	Commercial	F. S. Cooley	F. S. Cooley	25	.....	1	4	6
13—Sanders Field	23.3	½ Mile E. of Redwood City	Commercial	M. F. O'Dae	Mrs. C. Wampler	148	.....	1	5	7
14—Knight Field	24	1½ Miles N. of Vallejo	Commercial	F. E. Knight	F. E. Knight	90	110	2	7	†1
15—Concord Airport	24.5	2 Miles SE. of Concord	U. S. Dt. of C. Intermediate	W. T. McNulty	U. S. Dept. of Com.	80	.....	2	1	3
16—Palo Alto Airport	28	1 Mile SW. of Palo Alto	Commercial	Stanford Univ.	Asso. Air Serv., Ltd.	66	.....	2	19	18
17—Naval Air Station	31.5	Sunnyvale	U. S. Navy Dirigible Base	U. S. Navy	U. S. Navy	.....	1000	1	0	§
18—Livermore Airport	32	½ Mile NW. of Livermore	U. S. Dt. of C. Intermediate	J. A. Anderson	U. S. Dept. of Com.	77	.....	3	1	2
19—San Jose Airport	43.6	2½ Miles E. of San Jose	Commercial	J. Azevedo	E. Bradford	65	121	1	10	2

* Of the 269 planes listed in this column, 231 were civil planes, the remaining 38 consisting of 26 Army planes and 12 Navy planes.
‡ U. S. Army Personnel. † U. S. Navy Personnel. § Under Construction.

APPENDIX V

Expenditures and Receipts at Mills Field Compared With the Oakland Municipal Airport.

TABLE I

Capital Outlays, Expenses and Gross Receipts at the Two Municipal Airports, for the Five-Year Period Ending June 30, 1932. (Figures from the San Francisco Controller and from the Oakland Board of Port Commissioners.)

Expenditures—

	A. at Mills Field	B. at the Oakland Municipal Airport
I. Outlays for Purchasing Land:	$213,544.55*	$ 769,000.00
II. Outlays for Improvements (including preparation of field, buildings, equipment, etc.):		
Fiscal Year 1927-28	$102,720.07	These figures
Fiscal Year 1928-29	114,369.02	were not
Fiscal Year 1929-30	111,471.18	given by
Fiscal Year 1930-31	42,175.06	fiscal
Fiscal Year 1931-32	23,988.28	years
Totals	$394,723.61	$1,184,407.21
III. Expenses of Operation and Maintenance:		
Fiscal Year 1927-28	$ 32,961.70	$ 7,151.26
Fiscal Year 1928-29	48,879.11	39,423.23
Fiscal Year 1929-30	70,764.22	50,660.70
Fiscal Year 1930-31	64,567.60	57,062.78
Fiscal Year 1931-32	53,886.82	48,707.47
Totals	$271,059.45	$ 203,005.44

Receipts—

1. Gross Receipts:		
Fiscal Year 1927-28	$ 4,943.50	$ 14,641.72
Fiscal Year 1928-29	15,391.16	51,192.14
Fiscal Year 1929-30	18,612.93	90,962.86
Fiscal Year 1930-31	13,113.68	64,878.77
Fiscal Year 1931-32	12,988.28	56,378.95
Totals	$ 65,049.55	$ 278,054.44

* This includes the payment of two installments of $105,000.00 each for the purchase of land from the Mills Estate; a title premium, amounting to $1,605.00; and two installments of taxes, amounting to $1,939.55, paid by the City to the Mills Estate as the City's pro rata of taxes to the City of San Bruno and to the County of San Mateo.

(Appendix V Continued)

TABLE II

Five Years of Operation Losses at Mills Field Contrasted with Annual Profits at the Oakland Municipal Airport.

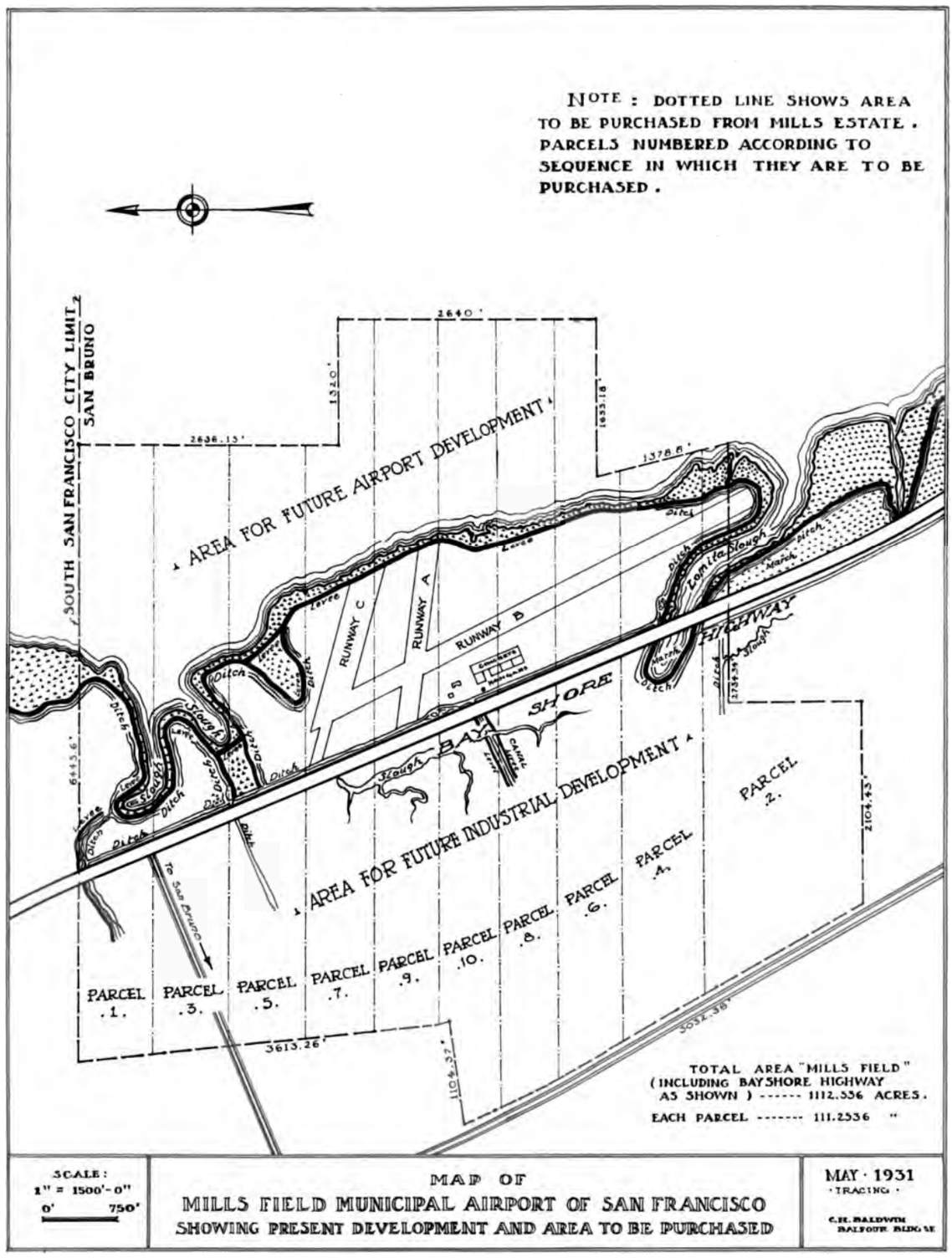
Expenses and Receipts—

	A. at Mills Field.				B. at the Oakland Municipal Airport.			
Fiscal Years	Cost of Operation and Maintenance	Gross Receipts	Ratio of Operating Cost to Gross Receipts	Operating Loss	Cost of Operation and Maintenance	Gross Receipts	Ratio of Operating Cost to Gross Receipts	Operating Profit
1927-28	$ 32,961.70	$ 4,943.50	6.66 to 1	$ 28,018.20	$ 7,151.26	$ 14,641.72	0.48 to 1	$ 7,490.46
1928-29	48,879.11	15,391.16	3.17 to 1	33,487.95	39,423.23	51,192.14	0.77 to 1	11,768.91
1929-30	70,764.22	18,612.93	3.80 to 1	52,151.29	50,660.70	90,962.86	0.55 to 1	40,302.16
1930-31	64,567.60	13,113.68	4.93 to 1	51,453.92	57,062.78	64,878.77	0.87 to 1	7,815.99
1931-32	53,886.82	12,988.28	4.14 to 1	40,898.54	48,707.47	56,378.95	0.86 to 1	7,671.48
Totals	$271,059.45	$65,049.55	4.16 to 1	$206,009.90	$203,005.44	$278,054.44	0.73 to 1	$75,049.00

TABLE III

Total Investment and Operating Losses at Mills Field by Fiscal Years.

Fiscal Years	Purchase of Land	Improvements	Operating Losses	Total
1927-28	.....	$102,720.07	$ 28,018.20	$130,738.27
1928-29	.....	114,369.02	33,487.95	147,856.97
1929-30	.....	111,471.18	52,151.29	163,622.47
1930-31	$106,605.00	42,175.06	51,453.92	200,233.98
1931-32	106,939.55	23,988.28	40,898.54	171,826.37
Totals	$213,544.55	$394,723.61	$206,009.90	$814,278.06


NOTE : DOTTED LINE SHOWS AREA TO BE PURCHASED FROM MILLS ESTATE. PARCELS NUMBERED ACCORDING TO SEQUENCE IN WHICH THEY ARE TO BE PURCHASED.
SOUTH SAN FRANCISCO CITY LIMIT
SAN BRUNO
AREA FOR FUTURE AIRPORT DEVELOPMENT
AREA FOR FUTURE INDUSTRIAL DEVELOPMENT
RUNWAY A
RUNWAY B
RUNWAY C
BAYSHORE HIGHWAY
Leonita Slough
Levee
Ditch
Slough
Canal
To San Bruno
PARCEL .1.
PARCEL .3.
PARCEL .5.
PARCEL .7.
PARCEL .9.
PARCEL .10.
PARCEL .8.
PARCEL .6.
PARCEL .4.
PARCEL .2.
2640'
1320'
2636.13'
1653.18'
1378.6'
6443.6'
2104.43'
3613.26'
1104.32'
3032.38'
TOTAL AREA "MILLS FIELD" (INCLUDING BAYSHORE HIGHWAY AS SHOWN) ------ 1112.556 ACRES.
EACH PARCEL ------- 111.2536 "
SCALE: 1" = 1500'-0"
0' 750'
MAP OF
MILLS FIELD MUNICIPAL AIRPORT OF SAN FRANCISCO
SHOWING PRESENT DEVELOPMENT AND AREA TO BE PURCHASED
MAY · 1931
· TRACING ·
C.H. BALDWIN
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APPENDIX VI

Mr. Adolph Uhl's Paper on the Subject of Mills Field, Dated April 22, 1931.

San Francisco Municipal Airport

The following report covering Mills Airport is submitted for the purpose of arriving at an immediate decision as to whether it is desirable that San Francisco should purchase additional lands from Mills Estate in the development of Mills Airport, or abandon Mills Airport for some other field.

Lease and Purchase of Mills Field.

On March 15, 1927, San Francisco made a three-year lease with Mr. D. O. Mills for a plot of land in San Mateo County, comprising 162 acres, for an airport. Before the lease expired, Mr. Mills died. The Mills Estate refused to renew the lease or to sell to San Francisco the land within the airport. In August, 1930, the Mayor and the Supervisors then negotiated with the Mills Estate for the purchase of 1112 acres as follows:

162 acres in the Mills Airport,
400 acres of submerged land in the bay—average cost of said submerged lands $950 an acre,
550 acres of land lying west of the Bayshore Highway.
Price of the 1112 acres—$1,050,000.

San Francisco has absolutely no use for those 550 acres lying west of the Bayshore Highway costing $525,000. The purchase of this acreage will become a dead investment, on which San Francisco must pay taxes to San Mateo County. A surprising condition of the purchase of those 550 acres is that the Mills Estate reserves the use of those 550 acres until the last payment is received from San Francisco ten years hence.

Terms of Purchase.

The Mills Estate demanded that the 1112 acres be laid out in ten parcels, approximately 400 feet in width, extending east and west, and that Mills Estate is to be paid $105,000 annually for each strip. San Francisco cannot be legally bound in the matter. Unless the Supervisors provide in each annual budget the sum of $105,000 for the purchase of the next parcel, the agreement lapses and the city is left with this strip of land which would be of absolutely no use to the city.

The cost of 1112 acres of land and the reclamation cost will amount to $2,741,000. The question to be decided at this time is, Should San Francisco invest $2,741,000 in a municipal airport?

The San Francisco Bay Airdrome, located on the east side of the Bay on the Oakland Harbor at Webster Street, has only 232 acres. Five of the six transport companies operating from the Bay section are now located at the San Francisco Bay Airdrome. Presumably, if it were not for the fact that the Boeing Air Transport Company has invested upward of $100,000 in a hangar at the Oakland Municipal Airport, the Boeing Company would also move to the San Francisco Bay Airdrome.

Revenue and Operating Costs.

It is estimated that Mills Airport receipts for the fiscal year—based on past nine months' operation—will be $16,000. The operating costs for the fiscal year are estimated at $70,000, leaving an operating loss of $54,000 for the year.

Earnings at Mills Field have fallen off considerably. This is due to competition and indicates that other airports enjoy advantages over Mills Airport. Why does Governor Rolph land and take off at the San Francisco Bay Airdrome on the east side of the Bay on his trips to San Francisco? Governor Rolph did take off from Mills Airport last Sunday for the San Joaquin Valley. However, the plane in which he traveled came over from the east side of the Bay. The Governor returned to Mills Field at 5 p. m., and the plane remained at Mills Airport only long enough to discharge Governor Rolph. On Tuesday morning Governor Rolph took off from the San Francisco Bay Airdrome, as he usually does. THE UNFAVORABLE LOCATION OF MILLS AIRPORT IS UNDOUBTEDLY THE ANSWER. The airmail for San Francisco is also landed in Oakland instead of at Mills Field.

Indications are that transport companies prefer the east side of the Bay, and this condition can be corrected only by development of an airport terminal immediately adjacent to San Francisco.

Comparison of Payrolls.

The payroll for 14 employees at the Mills Airport, for 1930-31, not including the pay of one policeman and one fireman detailed to Mills Field, making a total of 16 employees, is $34,599.84. The Oakland Municipal Airport is operated with 8 employees at an annual cost of $18,600. Salary increases of $4200 are requested in the 1931-32 budget for certain employees at Mills Airport, which would increase the payroll at Mills Field to $38,799.84—more than twice as much as the Oakland Airport payroll. Oakland pays its superintendent $250 a month; prior to 1929 the superintendent at Mills Field was paid $300 a month, and his salary

has since been raised to $500 a month. The superintendent was also recently furnished a Buick sedan.

Although Mills Field employees are capable of handling the fire-extinguishing apparatus, a fireman is on duty 8 hours of the 24. Aside from the usual minor fires—carburetors, etc.,—there has never been a fire at Mills Field.

The police officer at Mills Field could be dispensed with by swearing in the employees as deputy sheriffs, and that would give 24 hours police protection instead of 8 hours police protection as at present. The salaries of the fireman and the police officer, $4800 per year, should properly be charged to the airport instead of to the general fund.

Meteorologists.

There are three meteorologists at Mills Airport at salaries aggregating $5499. Salary increases requested in the 1931-32 budget would increase the salaries of the meteorologists to $6999. There are nine meteorologists at the Oakland Airport that do not cost Oakland one cent. Their salaries are paid by the Federal Government. Major Bowie in command of the Weather Bureau, which bureau has supervision over the airports where the Government has installed meteorological instruments, advises that the employing of meteorologists at Mills Airport is optional and rests entirely with San Francisco. The Federal Government will not pay the cost of these meteorologists. The duty of the meteorologist is to take readings of visibility, wind velocity, etc. That information, Major Bowie states, is available at the San Francisco Weather Bureau. There are no meteorologists at Curtiss Field.

1931-32 Budget.

The 1930-31 budget provided $210,000 for the Mills Airport; the Airport Committee of the Board of Supervisors requests $366,149 in the 1931-32 budget.

East Bay Airport Facilities.

There are at present five airports located on San Francisco Bay, as follows:

Oakland Municipal Airport, Class "A I A", 775 acres,
San Francisco Bay Airdrome, on the east side of the Bay, 232 acres,
Curtiss Airport, being developed at the Alameda mole—acreage unknown,
Mills Airport, present acreage 170 acres,
Curtiss Field, located 9 miles south of Mills Airport at Beresford, San Mateo County, adjacent to the new Bayshore Highway and the main highway, 425 acres.

In reply to the question, "If Mills Airport and the Curtiss Field nine miles below Mills Airport were for lease, which field would you prefer?"—the ready answer of

the aviators is Curtiss Field, for the reason that the climatic conditions are more favorable—the anemometer at Mills Field frequently records a wind velocity of 40 to 45 miles an hour, which is dangerous for small planes, which wind velocity does not exist at Curtiss Field.

Suggested Solutions.

Competition between Mills Field and Curtiss Field will undoubtedly be disastrous to Mills Airport and should be avoided. Both fields are being operated at a considerable loss. If the business of the two fields were combined under Curtiss operation, the Curtiss field could undoubtedly be operated at a profit and be in a better position to compete with East Bay airports. If necessary, San Francisco might, for the time being at least, provide a taxi airplane service between Curtiss Field and San Francisco. A further suggestion is to change the name to the San Francisco-Curtiss Airport.

Building up one major airport in San Mateo County is more likely to attract airport industries to this side of the Bay. The Curtiss people employ mechanics at the Curtiss Field. That is really the first step in the development of the airplane industry on this side of the Bay.

Curtiss Air Field has a Class A rating. This field will positively become a strong competitor to Mills Field, due to land and climatic conditions. Until Mills Field is raised two or three feet, it might become a bog during a very wet winter, as the field is only a few feet above the water level of the Bay.

Another suggestion would be to offer the Mills Estate $12,000 as rental for Mills Airport for the coming year in consideration of an extension by the Mills Estate on the purchase of Parcel No. 2 until July 1, 1932. That will provide an opportunity to consider more fully whether or not San Francisco should continue the operation of the Mills Airport.

This rental could be more than offset by the savings that should be made in the operation of the airport. If Oakland can operate her municipal airport with eight persons, San Francisco should be in a position to do likewise. The superintendent's salary should be restored to $300 a month.

If the foregoing solutions are not acceptable, some other solution must immediately be found in order to avoid what might prove to be another white elephant and a heavy burden to the taxpayers.

ADOLPH UHL.

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